VOL. XIX. No. 1.

ARCHIVES OF OTOLOGY.

OTITIS EXTERNA HÆMORRHAGICA.

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THERE seems to be a difference of opinion among otologists as to the significance of hemorrhagic vesicles on the walls of the bony auditory canal. The majority of writers, if they mention the presence of these vesicles at all, attach no particular importance to them, considering them for the most part as evidence of middle-ear inflammation. Schwartze and Wagenhäuser have noticed that these vesicles are occasionally present in the auditory canal, in the first stage of severe otitis media. Gruber alludes to the occasional appearance of these vesicles on the walls of the meatus, in describing the objective symptoms of otitis externa circumscripta, and says "in the severer forms, sometimes after the beginning of the disease, but more often in the later stages, there occur ruptures of small vessels, and consequently hemorrhages. When such effusions occur, beneath the epidermis, there are found on the walls of the auditory canal small or large dark livid-colored vesicles. These same burst, or, if artificially opened, pour out their bloody contents in the meatus, whereupon the vesicle collapses, and does not fill itself again." Thos. Barr, in his "Manual of Diseases of the Ear," in the chapter on otitis externa acuta, says: "In rare cases hemorrhagic elevations of the epidermis are seen on the floor of the osseous portion of the canal (otitis externa hemorrhagica)." Politzer, in his "Treatise on the Ear," devotes a chapter to the consideration of this subject, and under the name of otitis externa hemorrhagica, describes this form of inflammation. He says: "This form is characterized by hemorrhagic effusion in the osseous portion of the external

auditory meatus, accompanied with more or less well-marked reactive symptoms (Bing). It occurs usually in young persons without any known cause, commencing with moderate pain, tinnitus, and slight deafness. Examination reveals one or more dark-blue elongated swellings in the osseous meatus, situated on its inferior, more rarely on its posterior wall; these often extend to the inferior posterior segment of the membrana tympani on the one side, and to the cartilaginous meatus on the other, and by contracting the lumen of the meatus they interfere with the examination of the membrane. The condition in such cases is one of superficial inflammation of the cutis, the epidermis being raised to a great extent by the hemorrhagic exudation. On being probed the swelling feels soft and yielding, and may be perforated by very slight pressure, a blood-colored fluid escaping. The acme of this form of inflammation is, as a rule, reached on the third day. The hemorrhagic vesicles may remain for several days after the disappearance of the reactive symptoms, their contents being discharged by rupture, or absorbed. Very often, after the disappearance of these vesicles, others appear on other parts of the meatus. The result of otitis externa hemorrhagica is always recovery; the elevated epidermis of the meatus and of the membrane being cast off in large scales after 8–14 days, the diseased parts become covered with a fine, dry epidermic layer, and the hearing becomes normal."

The following cases, but five in number, were the only ones observed among two thousand five hundred aural patients.

Case 1.—Patrick H——, laborer, was seen February 17, 1885. He says he was struck by an engine several years ago, and that he has been deaf ever since. Day before yesterday he had some pain in the left ear, but no discharge.

Hearing distance, acoumeter: R E 3″ / L E 0″

A tuning-fork, vibrating, and placed on forehead, is heard louder in the left ear.

Examination: right mem. tympani very much retracted and thickened; left mem. tympani congested, and the lower portion

not seen, as it is obscured by a vesicle containing blood and about the size of a small bean, resting on the lower wall of the external meatus. Vesicle punctured, and powdered boracic acid insufflated. The patient was not seen again.

CASE 2.—Milton F., aged twenty-one, clerk, native of the United States, consulted me January 17, 1888, on account of an occasional stinging pain in the left ear, which he has had since January 13th, but there has been no discharge.

Hearing distance, watch : R E $\frac{2}{48}''$ L E $\frac{c}{48}''$

Examination : There is some congestion about the drumhead, especially along the handle of the malleus, of the right side. Slight secretion, which covers over a small perforation in the post. inferior quadrant of the mem. tympani. Bony portion of the left external auditory canal congested, and the dermal layer peeling off. There is a vesicle containing blood, about the size of a split pea, on the inferior wall of the canal, close to the drumhead ; and also a very small vesicle on the anterior wall.

The patient was given a solution of morphine and glycerine to drop into the left ear.

January 24th.—The acute appearances in the left ear are much better. Both vesicles have disappeared. There is slight congestion of the canal, and the drumhead is sodden and dull-red. To continue use of same drops.

January 27th—He has had no pain for four days. There is still slight congestion. To instil drops of zinc. sulph., grs. iii : ℥ i.

CASE 3.—Annie M., aged twenty-three, a native of the United States, consulted me April 17, 1888. She had a cold a week ago, and was very hoarse. She is troubled always with nasal catarrh. She never had an earache before, although she has had a buzzing noise at times in the left ear. Last Tuesday (one week ago) she awoke at 2 A.M. with a severe throbbing pain in the left ear, which seemed closed up. Tuesday night she had some pain for about two hours, and a ringing noise. That same night the right ear pained her from 6 to 9 P.M., when she fell asleep. She has had a noise like steam in both ears ever since, but not much pain. She does not complain of deafness. The left auditory canal contains three distinct separate hemorrhagic vesicles situated on the walls, and the drumhead is congested. She has well-marked naso-pharyngeal catarrh. She was given drops of atropiæ sulph., grs. ii : ℥ ii, to instil warm into the ear several times a day.

April 21st.—The right mem. tympani is now congested, as the left one was when she was first seen, and there is a hemorrhagic vesicle on the posterior wall of the bony auditory canal, close to the junction with the cartilaginous portion.

May 1st.—Left mem. tympani very much retracted and dull, and covered with some dry scales; right mem. tympani also retracted, slightly reddened and swollen, especially in the upper portion. The vesicle has almost dried up.

Hearing distance, watch : R E 10″ / L E 24″

The aërial conduction is better than the bony for both ears, as shown by the test with the tuning-fork. The ears were inflated by Politzer's method, and she was advised to use the atropia drops, if necessary. The patient was not seen again.

CASE 4.—John B. R——, aged seventy-one, a dentist, and also a native of the United States, consulted me December 18, 1888. A year ago he first noticed loss of hearing in the right ear. About the same time he was near a cannon that was fired, and he immediately experienced a numbness in the left ear. He has had a ringing noise in this ear for six months.

Hearing distance, watch : R E 1″ / L E 0″

Tuning-fork : Aërial conduction better than bony conduction for both ears.

Examination : A hemorrhagic vesicle extends from the cartilaginous portion of the canal, along the lower anterior wall of the bony canal to the drumhead.

When punctured, a few drops of a sero-sanguinolent fluid escaped. Auditory canal (bony) considerably congested.

Mem. tympani retracted, parchment-like, lustreless, with slight congestion about Shrapnell's membrane.

Right mem. tympani thickened, retracted, and lustreless.

After Politzer inflation, the watch was heard when pressed against the left ear. After evacuating the contents of the vesicle, powder of zinc. ox. et acid. borac. was insufflated.

CASE 5.—Patrick F——, thirty-two years of age, Irish, coachman, came to the N. Y. Eye and Ear Infirmary April 9, 1889. He says he never had any previous ear trouble. March 30th and 31st he had a cold in his head and a severe headache all night. He has had some pain since, but it has not been very severe, as well as some tinnitus and deafness.

Hearing distance: watch, $\begin{matrix} \text{R E } \frac{1}{2}'' \\ \text{L E normal.} \end{matrix}$

Tuning-fork: Aërial conduction better than bony conduction for both ears.

An elongated hemorrhagic vesicle extends from the cartilaginous portion of the auditory meatus, over the post. wall of the bony portion, and spreads over the post. superior quadrant of the drumhead.

There is also a vesicle covering the ant. superior quadrant of the drumhead, but it does not contain blood. The rest of the mem. tympani is deeply congested, except the ant. inferior quadrant, which is almost normal in appearance. Left drumhead fairly normal as to position and color.

The vesicle containing blood was punctured and a few drops of a bloody fluid evacuated. He was given drops of: ℞ Acid. borac., grs. xx; glycerin., ʒ ii; aq. ad ℥ ii, ♏, to warm and instil into the ear several times a day.

April 12th.—Hearing distance the same. There is less congestion and tinnitus. Politzer inflation does not improve the hearing.

April 16th.—The vesicle has disappeared. Congestion of canal and drumhead much less. There is some congestion of Shrapnell's membrane. Politzer inflation. To continue the use of the same drops. Patient not seen again.

It will thus be seen that my experience in regard to these cases has been very similar to that of Politzer's, and I offer the following conclusions:

1. Otitis externa hæmorrhagica is a rare form of disease.
2. It should be considered a disease *per se*, an inflammation of the external auditory canal.
3. It occurs more frequently among the young, although it may be found in the case of those advanced in years.
4. Males are more frequently affected than females. The left meatus is more frequently involved than the right. The pain is usually not severe.
5. The vesicles are usually found on the inferior wall of the bony auditory canal, although they may be situated on the anterior or posterior walls and even extend to the drumhead.

A CASE OF PERMANENT DEAFNESS MOST PROBABLY CAUSED BY QUININE.

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In September last, Mrs. S., a German lady, of more than usual intelligence, was referred to me through the courtesy of Dr. Samuel Woody, for an examination of her ears. Mrs. S. was so deaf that she could hear only a loud voice spoken close to her. My watch, ordinarily heard at forty inches, was not perceived even when pressed on either ear. Tinnitus was present to a slight but not very annoying extent. The tuning-fork C^2 was heard both longer and louder in the air than on the bone. On inspection the membrana tympani of each side appeared normal. Inflation by the Valsalva experiment, and with the Politzer bag, showed the Eustachian tubes to be pervious, but did not improve the hearing. The nasal passages and post-nasal space were in at least as healthy a condition as is usually found in this climate. No catarrhal symptoms had been experienced.

Mrs. S. gave the following history: She was thirty-three years old, married, and in good general health; five years previously, while suffering from a slight ailment, which she described as "a cold in the chest," her attending physician gave her twelve quinine pills, all to be taken within twenty-four hours; she did not know the quantity of quinine in each pill. While taking this medicine, and for a few days afterwards, she was very deaf, and the ringing in her ears very loud; the ringing gradually subsided and nearly disappeared; her deafness also improved for a few weeks, leaving her with the hearing power which she now possesses.

Reviewing the symptoms and history of this case, it seems fairly certain that it was one of permanent impairment of hearing caused by quinine, and that the labyrinth was the seat of disease. It is true that we are dependent on the statements of the patient for a description of her ill-

ness at the time the quinia was taken, and for the quantity of the drug administered; but the patient, as already stated, was of quite a high degree of intelligence, and from her account, I cannot believe that her original ailment was one likely to be followed by disease of the labyrinth.

That the case, when presented to me for examination, was an affection of the internal ears, I conclude from the tuning-fork test (aërial conduction both longer and louder than bone, with great impairment of hearing), from the healthy appearance of the membrana tympani, and from the absence of catarrhal symptoms of the nose or naso-pharynx. The patient stated that she did not hear better in a noise.

As regards permanent deafness from quinine authorities differ. Burnett ("Treatise on the Ear," edition 1884) says: "To the question, does quinine make one permanently deaf, the answer, so far as I am able to give it, is always in the negative." Pritchard ("Diseases of the Ear," 1886) says: "Certain drugs, but especially quinine and salicine, appear to have a direct influence on the internal ear, large doses of these producing tinnitus and deafness. These results, however, almost invariably pass off after a time, although in some few cases prolonged use of large doses has been followed by a considerable amount of permanent deafness." Buck, in his text-book, makes no mention of labyrinthine disease caused by quinine. Roosa ("Treatise on Diseases of the Ear") says: "Up to the time of this writing, I have had no opportunity of testing a case of impairment of hearing caused by quinine, as to aërial and bone-conduction. I predict that when such an examination is made, it will be found that tuning-fork C^2, in cases of impairment of hearing from quinine, will be heard better through the air than through the bones." Roosa concludes his article on this subject as follows: "From our present knowledge, both clinical and experimental, we are justified in asserting that the action of quinine upon the ears is to produce congestion of the labyrinth and tympanum, and sometimes distinct inflammation, with permanent tissue changes."

CASE OF IDIOPATHIC PERICHONDRITIS OF THE LEFT AURICLE.

By HENRY FERRER., M.D., San Francisco, Cal.

IN the literature I possess, and which I consider very extensive, the cases of idiopathic perichondritis of the auricle are comparatively rare. The quotations in the best text-books are few, and, as only the well-known cases of R. Chimani, H. Knapp, and O. D. Pomeroy seem to have attracted much attention, I consider myself justified in recording the following:

Miss F. K——, eighteen years old, called, August 8, 1886, to have her ears examined, stating that for the past few nights she had been awakened from sleep by pain in the left ear. I examined both ears, but finding them in perfect condition, thought her complaints were exaggerated, and made light of them. The following day she returned, accompanied by her mother, who requested me to examine her daughter's ears more carefully, stating that she complained continually all night and had no sleep. Patient, though not of robust constitution, had never been seriously ill, and never before had any affection of the ear. Both auricles are small, of perfectly regular form, so much so, that, according to her own statement, they were the only pretty parts of her head, and were found in normal condition. The left meatus, the side in which she had pain, was normally wide, the walls normal in appearance, and nowhere sensitive to touch; *Mt* n.; $h = \frac{1}{6}$. I prescribed quinine to be taken in the afternoon, as the pain always began in the evening, and advised her to remain in a room with even temperature, and to cover her ears with a thick layer of cotton held in position by a silk handkerchief tied around the head. The next day, August 10th, I was sent for, and found the patient had had considerable pain during the night, and for the first time the pain had not ceased at daybreak. I found her in bed, with the ear tied up as directed, and complaining continually.

The pain was described as sharp, shooting, continuous, and deep-seated. Again nothing was found on examination, except pain on strong pressure upon the tragus. I suspected a furuncle, applied a Priessnitz bandage, and prescribed McMunn's elixir of opium internally. The following day I removed the bandage, and found the anterior wall of the external meatus at the base of the tragus red, swollen, and very sensitive to the touch. I then felt more confident than ever that it was a slowly developing furuncle, and continued with the same treatment, it having given relief during the past night. Every following night after this was worse, the swelling gradually increasing until the orifice of the external meatus was reduced to one half its normal size. As I now expressed the wish to make an incision to relieve the pain, a surgeon was called in consultation, who advised me to take the temperature, thinking by the same to be able to tell whether or not a deep-seated abscess was forming. I took the temperatue regularly twice daily, and to avoid repetition I will now state that during the entire course of the disease the rise of temperature was very insignificant. It was at first, however, sufficient for my colleague to diagnose an abscess. On the 23d of August I made an incision under ether, after all the required antiseptic precautions had been taken. I made as long an incision as the narrowed meatus allowed me, cutting through its entire thickness, and probing thoroughly, until my friend was convinced that no pus would be found. Nothing but a moderate quantity of blood escaped; the wound was kept open by a drain of sublimate gauze, and an antiseptic dressing was applied. The night following the operation the patient slept well and complained but little. This was probably due to the exhaustion after the ether narcosis, for during the night of the 24th the pain again increased so much that two doses of one half teaspoonful each of McMunn's elixir of opium failed to bring any relief. The pain continued in this manner until the 15th or 20th of October, two and three teaspoonfuls of the opiate being taken every night. The first bandage was removed after forty-eight hours; it was naturally saturated with blood. The swelling had not decreased, but, on the contrary, extended to the entire circumference of the meatus, which was now completely closed. The treatment consisted in syringing the sinus in the anterior wall with a 2½-per-cent. solution of carbolic acid, the introduction of a gauze drain, and antiseptic dressing. The swelling then gradually extended to the tragus anteriorly, and

into the cavitas conchæ posteriorly, thence to the antehelix, to the descending portion of the helix, and backwards to the eminentia conchæ. Slowly, but gradually, the upper portions of the auricle became affected in turn: first the fossa triangularis, and at last the upper portion of the helix. The progress of inflammation could be followed daily, and in about three weeks the auricle was so deformed that none of its parts could be recognized; it stood almost at right angles to the head, was comparatively but little increased in height, but had attained a thickness of from three to three and a half centimetres. It was of a livid red, very sensitive and hard to the touch, and of increased temperature. All the cavities, the fossæ conchæ, helicis, et triangularis, were raised and were no more fossæ but tuberosities, the entire auricle appearing like a deformed lump of raw flesh. The skin of the lobulus, though congested by continuity, was not perceptibly involved in the inflammatory process.

The treatment had consisted as above mentioned in injections twice daily of carbolized water into the incision made, the introduction of a drain, and the auricle was covered with lint saturated with carbolized oil, over which a thick layer of gauze, cotton and a compressive roller bandage with elastic flannel was applied. The dressing which was changed twice daily was always found saturated with a moderate amount of purulent discharge. On September 1st for the first time, I noticed fluctuation and expressing the wish to make an incision, another surgeon, Dr. L. C. Lane, was called in consultation, who, with my consent and without asking permission, made a large incision in the posterior surface of the auricle and one in the raised skin of the concha, emptying about one teaspoonful of purulent discharge mixed with serous fluid. Two small rubber drains were introduced and twice daily the sinuses were syringed with carbolized water. At first no communication existed between the two openings, but a few days later the fluid syringed at the posterior incision passed freely from the wound into the concha as well as from the one in the anterior portion of the meatus. As agreed upon a poultice of slippery elm was kept continually on the ear, changed about every hour and held by a compressive bandage. The swelling continued until about the middle of October, when it began to recede, the discharge gradually decreasing, and the auricle began to take a less angry appearance. It was then visible to all that the auricle was shrinking, and had become very much disfigured.

The rounded edge of the helix was no more, in fact the entire cartilaginous structure was destroyed, the cutis very much wrinkled and the entire auricle having the appearance as if it had been flattened by compression, while the lobulus remained normal. The meatus was irregular in shape, but not reduced in size, *Mt* and hearing were not affected. In this condition the patient was discharged October 29th. I will mention that though the neighboring parts of the ear, the temporal, mastoid, and occipital regions, had become œdematous, the erysipelatous or phlegmonous inflammation, if I dare so express myself, never went beyond the insertion of the auricle.

I need not remark that a case like this, a pure idiopathic perichondritis, should not be ranged under the cases of othæmatoma of the ear. I am indeed very much surprised to see that, even in the last editions of some of our best text-books, the perichondritis auriculæ, is classified under the head of othæmatoma or phlegmonous diseases, or when mentioned separately but few lines are dedicated to it. I think that though rare, a disease which leaves so serious a disfiguration is entitled to a more accurate description, I may say to a chapter for itself, as done by Politzer (Lehrbuch der Ohrenheilkunde, 1882, II. Band, p. 676), though somewhat short. In most cases described, the affection began, like in this, in the ext. meatus, was considered a furuncle and an incision was made. A point might be raised at the present time, especially by the general surgeons who have lately shown not to be the greatest admirers of aurists—*i. e.*, did not an infection take place when the first incision was made? That this can be the case in spite of all the antiseptic precautions taken, is well known. For my part, if I ever have the opportunity of treating a similar case, I surely will not fail to make the required bacteriological experiments to ascertain, which microbes are contained in the pus, and if a special one is found more prevalent than the others, it can be suspected of being the generator of the disease. Pure cultures of the same obtained, I would try inoculations on animals, without which the work would not be complete and consequently no positive conclusions could be made.

TRAUMATIC PARTIAL ELIMINATION OF THE DRUMHEAD; CLOSURE OF THE DEFECT IN EIGHT WEEKS.

By A. EITELBERG, M.D., Vienna.

Translated by Dr. J. M. Mills, New York.

I DESIRE to report a case which, from all the literature I could examine, might justly be considered unique. It is with regard to the elimination of a large central portion of the left drumhead (which up to that time had always been quite healthy) in consequence of a severe blow on the side of the head.

I am acquainted with only one case that possesses some similarity with mine. It is reported by Schalle.[1] A man received such a severe blow on the ear that he was thrown down and was so overcome by intense dizziness that on attempting to rise he immediately sank again. There was considerable pain in the left ear, and tinnitus and deafness in both. Four days after the accident Schalle ascertained that, besides the considerably diminished sense of hearing, there was also moderate swelling and redness of the walls of the external auditory canal, "involving especially the vessels descending to the short process. Only about 1 *mm* in width of tympanum remained united with the wall. The manubrium was entirely isolated and not sharply outlined, but of dark-red color, and appeared as if it were thickened by the remains of the drumhead attached to it. The rim of the perforation was turned in, and therefore the whole portion between the manubrium and the edge of the tym-

[1] *Archiv f. Ohrenheilk.*, Bd. xii., S. 27.

panum looked as if it were *driven in.* There was a sero-purulent fluid in the tympanic cavity, the mucous membrane was swollen and of a dark-red color." After seven weeks' treatment the drumhead became attached to the separated portion by cicatricial formation.

Also the perception for speech and sound improved on the injured (left) side, though it was much less than that on the right side. The tympanum was dull and without reflex; it still desquamated and was retracted.

My case refers to a strong man, twenty-eight years old. The patient, a porter, was carrying a heavy fish-basket into the cellar, which unfortunately slipped from his hands and fell against his left temple, pressing the right side of his head against the cellar-walls. Immediately blood flowed profusely from the nose and the left ear. He did not become unconscious nor did he vomit, but he suffered severe pain in the anterior half of the head and became very dizzy. The next day, April 28, 1888, he consulted me. The hemorrhage from the left ear had lasted the whole night and continued during the examination. In the external auditory canal there were several blood coagula, which were removed, and the canal was found to be intact. The drumhead was suffused with blood and was extensively ruptured.

The rupture began above and behind and extended as far as the upper third of the manubrium. The vessels of the manubrium were injected and its lower extremity was somewhat thickened. The manubrium itself was distinctly outlined, the mucous membrane moderately swollen and reddened. The blood trickled slowly from two places: behind and below, from the shreds of the tympanum; and above and in front, where the separated portion of the drumhead was still in connection with the remnant of the membrane. The skin over the mastoid process was reddish-blue from extravasated blood.

On inflation according to Politzer the air passed through the perforation in the drumhead with a loud sound. Tinnitus was present only at times. The right aural canal was obstructed by a ceruminal plug, which was removed. The drumhead presented a normal appearance.

The examination of the hearing gave the following result: The sound of the tuning-fork c̄ only heard from the vertex, teeth, and forehead of the left side. On the right A > O [1]; left O > A;

[1] Aërial conduction better than osseous conduction.

still the tone on the right was "clearer" than on the left. On the mastoid process of the right side the tuning-fork c̄ was heard for fourteen seconds, and upon being transferred to the front of the ear was heard five seconds longer (Rinne's test, positive); on the left side it was heard fifteen seconds, but was not heard any longer in front of the ear (Rinne's test, negative).

My watch with a stop-arrangement was heard upon the temple (better here) and on both mastoid processes. By air conduction it was heard on the right in $\frac{1.20}{6}$ *m*, left in 2 *cm.* A whisper on the right was distinctly heard in 30 *cm* or less.

The treatment in the beginning was limited simply to the syringing the blood-clots, to inflation according to Politzer, and then a tampon of iodoform gauze was inserted. The hemorrhage from the ear continued, though only in a moderate degree, for five days; the tampon was always saturated with blood, which could always be seen oozing out from the previously mentioned points. The general condition of the patient was excellent; his appetite was good; there was no fever and no pain. The swelling in the region of the mastoid disappeared in the course of four or five days and the color of the skin became normal. The dizziness was not severe and was only especially noticeable when the patient stood up; only the stupor was still present.

In the meantime a peculiar change had taken place in the separated portion of the drumhead. It had been transformed into a dirty bluish-gray mass, somewhat rolled together. As I attempted to seize hold of this mass and draw it out, believing that it lay perfectly free in the tympanic cavity, I noticed that it was still attached, by a bridge above and in front, to the remnant of drumhead; at the time nothing could be seen of the manubrium. I did not force the extraction, but left the mass in the ear. The next day—the sixth day that he had been under observation—*I succeeded, with light syringing, in removing the dead piece of tympanum; it was about* 6 *mm long, and* 4 *mm wide.* A small rim of drumhead still adhered to the wall, and it was somewhat wider above. It was not at all inflamed. The tympanic mucous membrane, now extensively visible, showed no particular signs of inflammation; behind and above, the capitulum stapedis was freely exposed, and near it, at times, two pulsating points could be seen. The handle of the malleus was still invisible, very likely due to the fact that the tensor tympani, after the manubrium was detached from the drumhead, obtained the preponderance,

and thus withdrew the ossicle from the field of vision. An alcoholic boracic-acid solution (acid. boric. 1.0 : alcoh. 10.0 : aqu. dest. 15.0) was used twice daily. The hemorrhage from the ear stopped, and the secretion from the tympanic cavity was very scanty.

Having carefully observed the case from the beginning, I had no doubt at all concerning the origin and character of the piece eliminated ; but in order to be positive, I obtained a microscopical examination with the assistance of a well-known microscopist. The examination revealed : tesselated epithelium of one layer and connective tissue. Besides this, the remains of white blood corpuscles were found. There were also spores, proliferating yeastcells, and chlorophyl-cells, produced by the previous uncleanliness. No trace of the radiating and circular fibres could be discovered in the teased preparation. Besides, only a small portion of the interesting specimen, which I intended preserving, was subjected to a microscopical examination.

The patient's health was so little affected by these severe injuries, that he considered himself equal to the fatigue of thirteen days' military exercise (from which he could have been excused by a medical certificate), and in which he really joined without any apparent harm. During this time he paid no attention to his ear trouble and entirely ignored my suggestions for its care. Indeed, it required a most earnest request, before the patient decided (after three weeks' interruption) to renew the treatment of his ear trouble.

When I saw him again, May 27th, the rim of the perforation was enclosed by a red velvety border, which gradually became diffused. After the perforation of the drumhead had been reduced to half its original size, the level of the newly formed granulating tissue could be seen to lie lower than that of the remaining marginal portion of the drum. Later, this abrupt difference of level was equalized as the formation of the epithelial layer gradually progressed, and on June 9th the exceedingly small perforation of the drum could only be diagnosed by a very weak perforation râle from the air-douche. Only a spot as large as a pea was still injected and not entirely cicatrized.

On June 21st the loss of substance was entirely replaced and cicatrization completed. At the examination with Siegle's speculum, the resistant cicatrix made only moderate excursions. There had always been only a small quantity of sero-purulent secretion,

and this dried up several days before the complete closure of the perforation. The occasional headaches, as well as the tinnitus, have not recurred in the last two weeks. The treatment remained the same until healing ensued; latterly, however, the syringing was stopped and only the alcoholic boracic acid solution used in conjunction with inflations of air.

The last examination, made on June 16th gave the following results: L $\frac{0.12}{6}$ *m* for the watch with a stop-arrangement, R $\frac{2}{6}$ *m*. A whisper was heard on the left, in 110 *cm*.

The above-mentioned case presents several interesting features. In the first place the circumstance is noteworthy that an undoubtedly severe injury of the organ of hearing healed in such relatively short time and with comparatively little impairment of hearing. Then again, it is apparent from this case, that a loss of substance can be replaced in a few weeks. The simplest explanation of the elimination of the large central portion of the drumhead is, that the separated portion could not be sufficiently nourished through the small bridge to which it was attached in front and above. Perhaps, also, that the syringing of the blood-clots, in order to obtain a better view of the field of vision, forced the contiguous surfaces too far apart and thereby eventually prevented them from healing. In conclusion, the case was very instructive to me, as I had an opportunity to make a close clinical study of the cicatricial formation and to keep the case under observation until the final result was reached.

MALFORMATION OF THE AURICLE—PLASTIC OPERATION FOR THE CURE OF THE DEFORMITY.

By GORHAM BACON, M.D.

(*With two wood-cuts.*)

Martha D——, fourteen years of age, consulted me October 14, 1889, on account of a deformity of her right ear, to see if some operation could be performed for its correction.

The attachment of the right auricle is somewhat higher than the left, and the auricle hangs down as shown in the accompanying cut. It is somewhat smaller than the left and the cartilage is thinner. The right eye is also somewhat higher than the left, and the lower part of the face seems drawn towards the left side. Left membrana tympani normal in appearance.

Right auditory canal very narrow, about one third the diameter of the left, so that the drumhead is seen with difficulty, but it is smaller than the left and somewhat opaque.

H. D. Watch: right ear, 15″; left ear, normal. When the auricle is pressed back, the hearing distance is increased to 24″. The tuning-fork when vibrating and placed on vertex is heard louder with the right ear. The bone-conduction on this side is also better than the aërial.

Operation.—October 15, 1889.

Ether given by Dr. Gibson, and assisted by Dr. Adams, the House Surgeon, I removed an elliptical portion of integument and connective tissue ¾″ in width and 2¼″ long, from the posterior and upper portion of the auricle, commencing the incision at the beginning of the helix and carrying it along the fold at the attachment of the auricle almost to the lobule, so as to leave as little scar as possible. The integument and connective tissue having been dissected off, the cartilage was bent back on itself, but not divided, and the different folds and depressions on the auricle were brought out by so doing. The edges of the incision were

united by eight deep silk sutures introduced and passed through the posterior surface of the cartilage to hold it in better position, thus pulling the auricle upward and backward. Five cat-gut sutures were also used to bring the edges carefully together. The parts were washed with bichloride solution $\frac{1}{3000}$, and dusted with iodoform, and gauze applied, as well as a pressure bandage to keep the auricle in position.

No. 1.

October 7th.—Wound dressed—doing well.

October 27th.—Three or four remaining silk sutures were taken out, the others having been removed a few days ago. The ear has been dressed in the same way and a bandage applied. The line of incision has healed except at a small point above.

November 6th.—The wound has all healed, but on leaving off the bandage for a day, there was some drooping still, so that I decided to remove another small slice. Ether given ; I began the incision at the upper point and carried it downwards two thirds

the length of the pinna. The edges were then stitched together and the wound dressed as before. Five sutures were put in.

November 7th.—The ear dressed to-day—looks very well. Cotton and bandage reapplied.

November 9th.—Five stitches were taken out. Good union. Ear to be kept bandaged for some little time and she is to wear a pad with an elastic band for a short time.

No. 2.

She goes home to-day. Auricle in excellent position.

The hearing distance has increased from 15″ to 60″ for the right ear. A Galton whistle is heard well with both ears, but better with the left one.

TWO CASES OF PERICHONDRITIS AURICULÆ TREATED WITH THE SHARP SPOON AND THROUGH DRAINAGE.

By Dr. J. B. McMAHON, New York.

Case 1.—A. D., male, single, aged twenty-two, healthy, of temperate habits. He was thrown from a wagon on November 9, 1888, and fell on the right side of his head, receiving an abrasion of the auricle and a scalp wound, which was sewed up and healed promptly. He had no occasion to pay special attention to the ear until three weeks later, when it began to swell, as he thinks, from catching cold. The swelling, which was painless, gradually increased and began to discharge a very slight amount of pus. On January 7, 1889, he presented himself to me for treatment. The auricle then showed a large swelling which involved its entire anterior surface except the lobule, and was most pronounced over the concha. There was also a much smaller posterior swelling over the lower part of the auricle. A probe, passed through a minute opening situated over the concha, detected bare, rough cartilage. At this point an incision was made, and the sharp spoon used to evacuate a large quantity of pulpy material which formed a great part of the swelling. A small, short, rubber drainage-tube was then introduced and compresses of gauze and cotton adjusted in front and behind the auricle, and retained by a firm bandage to get as far as possible direct contact of the walls of the cavity. The dressing was renewed daily. The patient (who lives in Haverstraw) was seen again on January 12th. Drainage-tube removed. Cavity thoroughly spooned out and solid nitrate of silver applied. Poultices ordered for three days. On January 17th the anterior swelling was but one third of its original size. The swelling behind the auricle had not diminished. It was incised, some pus evacuated, and some strands of a silk thread passed through after a failure to connect the two openings with a silver drainage-tube. I did not see the patient again for more than a month. On January 19th, after marked exposure to cold, an erysipelatous (?) attack developed, which subsided after two or

three days. The thread was removed according to my instructions. By January 29th the healing was complete, some swelling being yet noticeable anteriorly. Some time later I saw the ear. It had recovered its normal shape except for a depression on the upper part of the antihelix and a slight incurvation of the helix at the same level. On January 23, 1890, the appearances were the same.

CASE 2.—R. G., female, married, aged twenty-seven, healthy, of temperate habits. Patient was seen first on November 2, 1889. For two days she had had very severe pains in left ear. I took it to be a case of ordinary furuncle in the lower part of the meatus. An incision was made on account of the intensity of the pain. Patient was seen again on November 8th. The swelling was more marked than before ; the pain severe ; the wound had healed. A free incision was again made, and still another on November 14th under similar circumstances. Patient was not seen again till November 29th, when she presented a distinct picture of perichondritis. Anteriorly was a swelling which filled out the concha. Behind and below was an oblong elevation which showed indistinct fluctuation. Dr. Knapp saw the case on November 30th.

An objection was made to the proposed incision, and a few days later an opening formed behind spontaneously. On December 5th a probe was inserted and carried through till its point was felt at the incisura intertragica. It could also be passed into the mass which made up the swelling anteriorly. After injection of cocaine a sharp spoon was introduced, carried upward and forward, and a large quantity of pulpy material scraped away. A small silver drainage-tube was inserted, and compresses and a firm bandage applied. This treatment was repeated on December 6th and 7th, but not as thoroughly as was desired, on account of the nervousness of the patient. December 11th, an incision was made over concha, and, after scraping cavity, a silver tube was passed downward and backward, projecting slightly beyond posterior opening. December 13th, sponged out and tube re-inserted. December 16th, tube replaced by some strands of silk thread. December 23d, moderate discharge of pus ; silk removed. December 25th, nitrate of silver in substance applied to the walls of the now tubular cavity. December 28th, entirely healed ; some swelling over concha. Compresses and firm bandage had been used all along.

January 16, 1890, scarcely perceptible swelling in front of antitragus ; no deformity. January 23d, condition the same ; no shrinking.

ON THE SURGICAL TREATMENT OF DIFFUSE PHLEGMONOUS INFLAMMATION OF THE AURICLE.

By E. GRUENING, of New York.

IT is not generally conceded that ordinary boils of the external auditory canal may give rise to diffuse phlegmonous inflammation of the auricle. In the recorded cases of phlegmon and perichondritis of the auricle, it is mentioned that the starting-point of the affection could be traced to some inflammatory trouble in the region of the meatus, but nowhere is it distinctly stated that the diffuse inflammation of the auricle began as a furuncle of the auditory canal. It is true that in follicular phlegmon of the external auditory canal, the wall of the affected gland forms an effective barrier, limiting the process of suppuration to the confines of the follicle. Occasionally, however, it does happen that the infection travels in an outward direction, invading the whole substance of the auricle; and it appears, from my observations, that the diffusion of the infection takes place by direct and continuous structural changes, and not by transport through the lymphatics. In my aural practice extending over twenty years, this unusual course of furunculosis of the external auditory canal was observed in two cases, and both in females of the upper walks of life.

The first case was that of a lady, thirty years of age, who consulted me in March, 1887. She had been suffering several weeks from a succession of boils in both auditory canals. At the time of her visit I found large and florid boils in both canals, and incised them deeply and freely. From the right ear I removed

some pus and a plug of necrotic tissue; from the left ear some pus only. The wounds were washed with absolute alcohol, and dressed with iodoform gauze. The patient was directed to apply dry heat in the form of chamomile bags over both ears. A few days later the wound in the right ear, from which the necrosed tissue had been dislodged, had closed, the swelling had subsided, the pain abated. In the left ear another boil had sprung up. A deep incision gave but temporary relief. In the course of the following week a tense and elastic swelling developed in the corresponding concha. I cut into the swelling and evacuated a copious mass of sero-purulent fluid. In spite of thorough antiseptic manipulation, a succession of swellings appeared in the concha, antihelix, fossa of the helix, and helix. These swellings were repeatedly opened, their sacs irrigated with bichloride of mercury solution, 1–5000, and dressed with iodoform gauze. In the course of time a number of circumscribed swellings appeared on the posterior aspect of the auricle, and after an assiduous treatment of two months, every natural curve and depression of the once beautiful form of the ear had become effaced. The auricle was a red, swollen, shapeless mass. The lobe of the ear participated in this general tumefaction. The glands before, behind, and below the ear were enlarged. On May 12th, when this process had lasted more than two months, I pierced the auricle by means of a bistoury at three points, transfixing the concha at one point and the fossa of the helix at two different points. I enlarged these perforating wounds severally to the length of 1 *cm*, and drew through them bands of iodoform gauze to insure permanent drainage. The subsequent course of this case was very satisfactory. The auricle became less tender, and the redness and swelling disappeared. In ten days the drainage bands were removed. The disease was arrested, but the auricle remained misshapen.

The second case I saw in the practice of Dr. Millard, of this city. A lady, over seventy years of age, a bed-ridden invalid, suffered from a succession of furuncles of the auditory canal. An operation was at first refused, but later consented to when the disease had spread, converting the natural concavity of the concha into a globular, tough, and elastic swelling. First I incised the furuncle and curetted its cavity, which I found filled with granulation tissue; then I transfixed the concha and evacuated a great quantity of sero-purulent material. I irrigated the

field of operation with a solution of bichloride of mercury 1–5000, and placed a band of iodoform gauze through the perforated concha. The operation arrested the course of the disease, of which, two weeks later, every trace had vanished.

It was certainly owing to this timely operative interference that in this case the shape of the auricle remained intact.

Conclusion.—In cases of incipient and protracted diffuse phlegmonous inflammation of the auricle, single or multiple transfixion of the auricle at the seat of greatest swelling and the establishment of permanent drainage are indicated.

THE BACTERIOLOGY OF SOME INFLAMMATORY PROCESSES OF THE MIDDLE EAR AND THE MASTOID CELLS.[1]

By A. A. KANTHACK, B.A., B.Sc., F.R.C.S., etc., London.

SHORTLY after the publication of Prof. Zaufal's[2] admirable studies on the bacteriology of otitis media, Dr. Hartmann induced me to work on similar lines, placing the material of his "Poliklinik" at my disposal. This I did with pleasure, making use of fifty-seven cases which were classified under the following heads: (1) *otitis media acuta;* (2) *otitis media chronica;* (3) *suppuration of the mastoid process;* (4) so-called "*exudations*" *of the tympanic cavity.* Dr. Hartmann helped me in every possible manner, and kindly permitted me to make use of his skilful hand whenever a paracentesis had to be performed with such care as studies of this nature require it. It is therefore my pleasing duty here to express my sincerest gratitude for all his services.

During the past years several papers have appeared on this subject, so that for some time I could not make up my mind to place the few results of my investigations before the world, all the more as they bring hardly any thing new. I need only mention the papers by Drs. Gradenigo,[3] Levy and Schrader,[4] who, following the footprints of Drs. Netter,[5] Rohrer,[6] Zaufal,[7] and Moos,[8] have further investigated this field. Yet one or two items seem to me to be of special in-

[1] From Dr. A. Hartmann's "Poliklinik" and the bacteriological laboratory of the Pathological Institute, Berlin.

[2] Zaufal: *Prager med. Wochenschr.*, 1889, 6–12; *ibidem*, 1888, 8, 20, 21, 45, etc., etc.

[3] Gradenigo: *Annales des maladies de l'oreille*, etc., 1889, pp. 526 and 527.

[4] Levy and Schrader: *Archiv f. experim. Patholog.*, xxvi., p. 223.

[5] Netter: *Annales des maladies de l'oreille*, etc., 1888, No. 10, Oct.

[6] Rohrer: *Deutsche med. Wochenschr.*, 1888, 44.

[7] Zaufal: *loc. cit.*

[8] Moos: *Deutsche med. Wochenschr.*, 1888, 44.

terest, and thus I venture to add my modest results to those of others. These I shall now enumerate as shortly as possible, so as not to tire with a description of well-known facts.

The methods employed by myself correspond more or less to those of Prof. Zaufal—*i. e.*, in a few words, the pinna, meatus, and cheek were cleansed as carefully as possible with a solution of corrosive sublimate; when a paracentesis was necessary, I always applied to Dr. Hartmann, who removed a trace of pus or exudation with a sterilized platinum needle. Trusting his skill, I could be certain not to get any germs from the walls of the meatus on the platinum needle. Having in every case obtained the material with all the precautions demanded by Koch's method, small test-tubes containing a few *ccm* of bouillon were inoculated and then taken to the bacteriological laboratory of the Pathological Institute to be further worked out. Agar-cultivations were made, other larger test-tubes containing bouillon inoculated, and three gelatine plates prepared. The original tube was used for inoculation experiments on animals (white mice and guinea-pigs), as this forms the best clue to the presence of the diplococcus pneumoniæ (A. Fränkel). All bouillon-tubes were kept for some time, to see whether pure cultivations of the diplococcus were present or not.

I do not consider myself competent to express an opinion on clinical questions, whether, for instance, different forms of otitis media acuta might be distinguished according to the particular micro-organism present, or whether the nature of the coccus found affects the prognosis. On the one hand, my experience is too small; on the other, my investigations were not directed to these points. I was always satisfied to recognize the organisms found in the tympanum at a certain period of inflammatory ear-disease, whether such organisms were pathogenic or not. Accordingly I must admit, in harmony with M. Gradenigo,[1] that in acute cases we may often find the diplococcus pneumoniæ (A. Fränkel), alone or together with other cocci and bacilli, but that in true chronic cases I have never yet succeeded in obtaining this bacterium. However, one need not wonder at this, for

[1] Gradenigo: *loc. cit.*

we see the same in the pneumonic foci of the lungs, where we may almost with absolute certainty reckon on finding the diplococcus in the recent parts. Unfortunately I could not, for want of time, direct my attention on this interesting question, viz.: how long after the commencement of an otitis media acuta which presented the diplococcus alone or in company of other cocci the former may be traced, and when it disappears to make room for the better vegetating organisms.

I shall now give an objective summary of the bacteriological conditions of the cases examined (mostly in the form of tables).

1. *Otitis Media Acuta.*

Only such cases were selected in which the disease had lasted a short time (preferably a few hours), and altogether thirty-one were examined. A paracentesis was performed in eight, so as to give me the chance of obtaining the secretion as fresh as possible. In the other cases, which of course lasted a little longer, there was a spontaneous perforation. Cases older than three days have not been entered in these tables.

TABLE I.

EIGHT CASES, WHERE A PARACENTESIS WAS MADE.

(1) Diplococcus pneum. (Fr.).	SPECIAL REMARKS.
(2) Diploc. pneum. (Fr.). Staphylococcus pyog. albus.	Two kinds of bacilli were found possessing the power of producing a green color. Of these one was the ordinary "pyocyaneus" and its coloring matter answered accurately all the reactions described by the two Proff. Babes (*i. e.*, becoming considerably darker on shaking and allowing air to enter). The other [called pyocyaneus (x) in the tables] is a very small bacillus, exhibiting, when examined in a hanging drop, vivid movement. On a gelatine plate it grows as small greenish yellow colonies sunk in the depth of the nutrient soil; it liquefies gelatine, at the same time producing a green coloration, which, however, does not change on shaking. The green color, which is lighter than that of the ordinary "pyocyaneus," is best seen in bouillon cultivations. This bacillus has no pathogenic properties, at least as far as white mice and guinea-pigs are concerned.
(3) Diploc. pneum. (Fr.). Bacillus saprogenes II. (Rosenb.).	
(4) Diploc. pneum. (Fr.). Staphyloc. cereus albus. "Bacilli" (*v. infra.*).	
(5) Diploc. pneum. (Fr.). Staphyloc. pyog. albus. Bac. saprogenes II. (Rosenb.).	
(6) Diploc. pneum. (Fr.). Bacillus pyocyaneus. Bac. saprogenes I. (Rosenb.).	
(7) Diploc. pneum. (Fr.). Bac. saprogenes I. (Rosenb.). Bacillus pyocyaneus (x).	
(8) Staphyloc. pyog. aureus. " " albus. Bac. saprogenes I. (Rosenb.).	

TABLE II.

TWENTY-THREE CASES, WHERE A SPONTANEOUS PERFORATION HAD TAKEN PLACE.

(1) Diploc. pneum. (Fr.).	
(2) Diploc. pneum. (Fr.)	
(3) Staphyloc. pyog. albus.	
(4) Staphyloc. pyog. albus.	
(5) Staphyloc. pyog. albus.	
(6) Staphyloc. cereus albus.	
(7) Staphyloc. cereus albus.	
(8) Staphyloc. cereus flavus.	
(9) Diploc. pneum. (Fr.). Staphyloc. pyog. aureus.	
(10) Diploc. pneum. (Fr.). Streptoc. pyogenes.	
(11) Staphyloc. pyog. albus. " " citreus.	
(12) Staphyloc. cereus flavus. " " albus. " pyog. albus.	This case had long been chronic and suddenly signs of acute inflammation appeared. The bacterial. conditions were the same before and after the relapse (*v. infra.* Table III., 2).
(13) Staphyloc. pyog. albus. " " aureus. " " citreus. " cereus flavus.	
(14) Diploc. pneum. (Fr.). Bac. pyocyaneus.	
(15) Diploc. pneum. (Fr.). Staphyloc. cerus albus. "Bacilli."	*v. infra.*
(16) Diploc. pneum. (Fr.). Streptoc. pyogenes. Staphyloc. pyog. aureus. Bac. saprogenes I. (R.).	
(17) Diploc. pneum. (Fr.). Staphloc. pyog. albus. Bac. saprogenes I. (R.).	
(18) Diploc. pneum. (Fr.). Staphyloc. pyog. albus. Bac. saprogenes I. (R.).	

(19) Staphyloc. pyog. aureus. " " albus. Bac. pyocyaneus (x).	In this case complications arose in the shape of suppuration in and over the mastoid process, which necessitated the laying open of the mastoid cells and antrum. Besides pus, a cholesteatome was found and removed. Unfortunately, illness prevented me from examining the latter. The abscess over the proc. mast. was examined bacteriologically (*v. inf.*). During the operation an osseous fistula was made out, connecting the empyema of the mastoid cells with the superficial abscess. The patient died with symptoms of meningitis, and inoculations were made with the subarachnoidal fluid and the contents of the lateral ventricle of the diseased side (*v. inf.*). Here also the staphyloc. pyog. aureus and albus were found.
(20) Stapyhloc. pyog. albus. " " aureus. " Bacilli."	This case, also, was complicated by suppuration in the proc. mast. (*v. inf.*).
(21) Staphyloc. pyog. aureus. " cereus albus. Proteus vulgaris (Hauser).	Here a fetid otorrhœa had existed for a long time, when suddenly very acute phenomena appeared. Inoculations, which were at once made, showed that no changes had occurred in the bacteriological conditions (*v. inf.* Table III., 1).
(22) Staphyloc. pyog. citreus. " cereus albus. " Bacilli."	*v. inf.*
(23) Staphyloc. cereus albus. " " flavus. " pyog. aureus. Bac. pyocyaneus (x).	With regard to the bac. pyocyaneus (x), *v.* Table I.

On making a short review of these thirty-one cases of acute otitis media, we find that (1) in only few cases there were pure cultivations of the diplococcus pneumoniæ (Fr.), viz.: 3, 31; (2) in most cases the diplococcus occurred in conjunction with the staphylococcus; (3) in the cases examined by myself, the streptococcus pyogenes was seldom found, and never as a pure cultivation; (4) even in acute cases, where the membrana tympani is entire, we find other non-pathogenic organisms (bacilli). We need not wonder that "saprophytes" and other bacilli find their way into the middle ear, if we consider that the latter communicates with the naso-pharynx and thus with the air, and again that the bac. saprogenes I. (Rosenbach) is often found in normal saliva. (5) In every case, where suddenly a relapse occurred after

the same had long been quiescent and chronic, I never found any changes in the bacteriological conditions which might correspond to a "secondary infection" (Zaufal).

We now come to the chronic cases, of which twelve were examined, and in most of which the pus had a highly offensive odor.

TABLE III.

TWELVE CASES OF CHRONIC OTITIS MEDIA (OTORRHŒA).

(1) Staphyloc. pyog. aureus. " cereus albus. Proteus vulgaris (Hauser).	*v.* Table II., 21.
(2) Staphyloc. cereus flavus. " " albus. " pyog. albus.	*v.* Table II., 12.
(3) Staphyloc. pyog. albus. Bac. saprogenes (x).	*v. inf.*
(4) Bac. saprogenes I. (R.).	
(5) Staphyloc. pyog. albus. " " aureus. Proteus vulgaris (H.). Bac. pyocyaneus (x).	
(6) Staphyloc. cereus albus. " " flavus. " pyog. albus.	
(7) Staphyloc. pyog. albus. " " aureus. " cereus albus.	
(8) Staphyloc. pyog. albus. Bac. saprogenes (x).	*v. inf.*
(9) Staphyloc. pyog. albus. " " aureus. Proteus vulgaris (H.).	
(10) Staphyloc. pyog. aureus. " cereus albus.	
(11) Staphyloc. pyog. albus. " " aureus. Proteus vulgaris (H.). Bac. pyocyaneus (x).	
(12) Staphyloc. cereus albus. " cereus flavus. " pyog. albus.	

It seems to me to be of special interest that I never succeeded, in chronic cases, in finding the diplococcus pneumoniæ (Fr.).

I have been able to examine seven cases of suppuration of the mastoid cells and antrum.

Only in one case I have found the streptococcus pyogenes present, although in each instance I have carefully looked for the same.

TABLE IV.

SEVEN CASES OF SUPPURATION IN THE MASTOID PROCESS.

(1) Diploc. pneum. (Fr.). (Pure cultivation.)	This was a very acute case, where, shortly after the appearance of the otitis media, suppuration in the mastoid process could be made out.
(2) Staphyloc. pyog. aureus. " " albus.	*cf.* Table II., 19.
(3) Staphyloc. pyog. aureus. " " albus. "Bacilli."	
(4) Staphyloc. pyog. albus. Streptoc pyogenes.	
(5) Staphyloc. pyog. albus. " " aureus.	
(6) Diploc. pneum. (Fr.). Bacillus saprogenes (x).	*v. inf.*
(7) Staphyloc. pyog. aureus. " cereus albus.	

Finally, we come to cases which, as far as I am aware of, hitherto have not been examined bacteriologically, and to which I have devoted most attention. I mean those cases where, with or without deafness occurring, the presence of exudation in the tympanic cavity can be made out without there being any signs or symptoms which allow us to speak of an acute otitis. The membrana tympani is not reddened; there is no pain, though subjective noises may be present. The "exudation-line" may be clearly seen to move with the movements of the patient's head, who often complains of coryza, or has just got over an attack of nasal catarrh. There may also be swelling of the tuba Eustachii. Such cases are put down as simple catarrhs or "exudations" (otitis media catarrhalis exudativa, and are generally cured by catheterization and the air-douche. In seven instances Dr. Hartmann performed the paracentesis with all necessary

precautions, so as to give me an opportunity of examining these cases bacteriologically.

TABLE V.

SEVEN CASES OF "EXUDATION" IN THE TYMPANIC CAVITY.

(1) Staphyloc. pyog. albus. Bac. saprogenes (x).	*v. inf.*
(2) Staphyloc. pyog. albus. Bac. saprogenes I. (R.).	
(3) Staphyloc. pyog. albus. Bac. saprogenes (y).	A small bacillus (*v. inf.*).
(4) Staphyloc. pyog. albus. Bac. saprogenes (y).	
(5) Diploc. pneum. (Fr.). Bac. saprogenes (x).	*v. inf.*
(6) Staphyloc. pyog. albus. " cereus albus. Bac. saprogenes I. (R.).	
(7) Staphyloc. cereus albus.	This was a case where the exudation had existed a long time before a paracentesis was made.

We see that in these cases, though suppuration never sets in, yet the typical "pyogenic" organisms are found. I shall not enter here into any theories or deductions which may suggest themselves, as it is simply my intention to describe as objectively as possible the results of a bacteriological investigation extending over several months. I do not doubt that mistakes have crept in, but I have always been careful to exclude all such cases where there was a suspicion of an error. I only wonder that I so rarely found the streptococcus pyogenes, and can only attribute this to chance. On the other hand, most of the cases examined were exceedingly benign.

Finally, I shall give a table of the various bacilli which I came across during this little study. In the above tables I have repeatedly used the terms "Bacilli" and "Bac. saprogenes (y)." During the whole investigation I devoted some attention to the bacilli, partly on account of a remark made by Mr. A. E. Barker,[1] who, while speaking of "cerebral abscesses after middle-ear disease," expressed the idea that,

[1] A. E. Barker, *Illustr. Med. News*, 1889.

according to the nature of the saprophytes found in such abscesses, we might expect differences in the clinical and pathological appearances of the same. Hence I first intended to cultivate the various forms and species of bacilli, and then eventually to carry my experiments further, following out the suggestions by Mr. Barker. My results are far from final, but in the appended table I have enumerated the various kinds of bacilli found.

TABLE VI.

BACILLI OBTAINED FROM THE ABOVE CASES.

(1) Bac. saprogenes I. (Rosenbach.)	
(2) Bac. saprogenes II. (Rosenbach).	
(3) Bac. pyocyaneus.	*cf.*, Table I.
(4) Bac. pyocyaneus (x).	*cf.*, Table I.
(5) Bac. pyocyaneus (y).	This bacillus is very similar to the previous one, but the coloring matter produced by the same is brighter.
(6) A very small bacillus.	This bacillus does not liquefy gelatine, grows slowly in the latter, and produces a light-blue lustre on the surface of the gelatine.
(7) Bac. saprogenes (y)	A small bacillus corresponding to the one described by Drs. Levy and Schrader.[1]
(8) Proteus vulgaris (Hauser).	
(9) Bac. saprogenes (x).	A saprophyte very like the bac. saprogenes I. (Rosenbach); liquefies gelatine quickly, but has less tendency to form spores.

With the exception of the ordinary bac. pyocyaneus, none of these bacilli presented any pathogenic properties in mice or guinea-pigs.

In conclusion I express my gratitude towards my friend, Dr. E. Müller, assistant at Dr. Hartmann's Poliklinik, for all the services which at any time he has offered me, and also use this opportunity of showing my obligation to Prof. R. Virchow for the permission he so kindly granted me to execute these experiments at the bacteriological laboratory of the Pathological Institute (Berlin).

BERLIN, January, 1890.

[1] *Loc. cit.*

DIPHTHERITIC INFLAMMATION OF THE MUCOUS MEMBRANE OF THE TYMPANUM (A CONTRIBUTION TO THE PATHOLOGY OF THE ORGAN OF HEARING).

By S. HIRSCH, of Hanover, Prussia.

(*With plate ii.*)

Translated by Dr. H. A. B. Macauley, of New York.

OF all the diseases which children especially are subject to, the affections of the delicate mucous membranes, particularly those of the air passages, occupy a prominent position. Experience has taught us that there is a great tendency upon the part of the morbid process, during the course of the disease, to spread to neighboring regions. We find, for instance, that the great majority of cases of diseases of the pharynx and larynx are complicated by implication of the Eustachian tubes and middle ear, thus changing the aspect of the case entirely and rendering it much more important.

A simple catarrh of the pharynx or larynx may spread to the mucous membrane of the tympanum and establish itself there as catarrh of the middle ear. But it is not only the simpler affections of the mucous membrane of the air-passages that are apt to implicate the tympanum, for in diphtheria, croup, and scarlatina the middle ear is often attacked, with the most serious results. Bearing in mind the classification of Virchow, to the effect that the croupous exudation is merely a superficial layer upon the surface of the mucous membrane, while the diphtheritic exudation infiltrates the tissue itself, the numerous experiments of dif-

ferent observers have shown that in nasal diphtheria inflammations of the middle ear occur, which we must regard as either croupous or diphtheritic. Croupous membranes may be easily detached from the surface, which then appears swollen and hyperæmic. The diphtheritic membrane, on the contrary, is firmly attached to the underlying tissues, which bleed upon its removal. In both kinds of inflammation there is a fibrinous exudation, accompanied by emigration of the blood cells; in both we find partial disappearance of the superficial epithelial layer, so that the membranes are composed of threads of fibrin, pus cells, and epithelial cells. But while the structure of the mucous membrane remains unchanged in croupous inflammation, or is invaded by pus cells rising to the surface, in the real diphtheritic form we find the tissue itself, attacked by coagulation-necrosis in larger or smaller patches. This death of the cells and tissue is accompanied by coagulation within the cells and other constituents of the tissues. The cell nucleus disappears, and the protoplasma becomes homogeneous in a peculiar manner. According to this, one might designate the croupous inflammation as "fibrinous," and the diphtheritic form as "fibrino-necrotic." It must, however, be conceded that the true nature of the above-mentioned forms has not yet been recognized with certainty, and opinions vary as to the development and constituents of the diphtheritic deposits. The ordinary acceptation that these consist of a fibrinous exudation, with profuse nuclear proliferation, is opposed by those who maintain the principal causative factor to be a real epithelial degeneration. It is universally believed that micro-organisms play an important part in both processes, although they have not yet proven to be the specific morbific agent.

All observers of croupous or diphtheritic inflammation have described numerous forms of bacteria, but it has not been decided which of these was the specific agent, and which the products of secondary decomposition. Weigert's[1]

[1] *Fortschritte der Medicin*, 1887, Bd. v., No. 8. Ueber eine neue Methode zur Färbung von Fibrin und von Mikroorganismen.

method of staining fibrin, which we will refer to later on, enables us to exactly examine with the microscope the relation which exists between the fibrinous membrane and the tissue of the mucous membrane of the tympanum. The following observations were made at Würzburg, upon two children who had died of diphtheria of the pharynx and larynx. My teacher, Dr. Kirchner and his assistant, Dr. Mayer, were kind enough to aid me in every way, and placed the material of the policlinic at my disposition.

In the first case, a girl of seven, the left *Mt* showed nothing remarkable; the tympanum was filled with a small quantity of viscid mucus; there was no excessive hyperæmia of the *Mt* or tympanic mucous membrane. The appearances were about the same on the right. Microscopical examination of the tympanic mucous membrane, which was stained with alum-carmine, showed a fair amount of vascular congestion, such as would be present in a light catarrhal inflammation. It is worthy of notice that the middle ear was only lightly implicated in this case, which was one of intense pharyngeal and laryngeal diphtheria. The Eustachian tubes, stained with Delafield's color, were examined, and an infiltration of small cells was noticed in the mucous membrane. A slight exudation, consisting of pus cells, fibrin, and mucus, was found within the tube. In isolated places the cylindrical epithelium had disappeared, and at these points the exudation was more marked. The cylindrical cellular layer, wherever it was present, was saturated with the exudation. Wendt[1] found similar appearances. He says that in most cases only collateral hyperæmia, or catarrh of a mucous or purulent nature, may be demonstrated. In five cases of children who had died of croup or diphtheria, there was only one of implication of the cartilaginous tube, with collateral hyperæmia and swelling of the mucous membrane of the middle ear.

Three of the other four cases gave evidence of a simple purulent middle-ear inflammation, while the remaining one had an acute catarrhal inflammation of the same cavity.

[1] *Arch. f. Heilkunde* (Wagner), Bd. xi. und xiii.

These were evidently secondary to the hyperæmia and swelling of the naso-pharyngeal mucous membrane, which in its turn was due to the croup of the lower region of the pharynx. Schwartze [1] also says that in most cases of croup or diphtheria of the mucous membrane of the pharynx and nose, there is only a simple purulent catarrh of the tympanic cavity. In a case of diphtheria with intense throat symptoms, Kupfer [2] found the mucous membrane of the Eustachian tube and tympanum quite intact, notwithstanding the presence of extensive diphtheritic ulceration of the pharynx, larynx, and bronchial tubes. In our own case, the exudation, consisting of pus cells and coagulated fibrin, showed a membranous appearance, and we are therefore led to believe that there existed a beginning croupous inflammation of the mucous membrane of the tubes, the development of which was interrupted by the death of the patient. The second case was a child twenty-one months old, whose death was due to laryngeal and pharyngeal diphtheria. By macroscopical examination the right *Mt* was seen to be thickened and lustreless. A small deposit of pus about the size of a lentil was found in the fossa sigmoidea and a thrombus existed in the sinus transversus. The inner surface of the *Mt* was covered with succulent mucous membrane. The mucous membrane of the tympanum was greatly thickened, almost obliterating the entire cavity, and was covered with a tenacious membranous deposit, which was adherent to the mucous membrane and could only be detached with difficulty. A muco-purulent exudation oozed up from the deeper regions. On the left side ecchymoses were noticed upon the tegmen tympani, while the *Mt* and tympanum were in the same condition as on the right. The mucous membrane of the tympanum and the membranous deposits adherent to it, together with a portion of the cartilaginous Eustachian tube were removed, immersed in absolute alcohol, and then stained with borax-carmine, and hardened in alcohol, oil of cloves, oil of turpentine, and turpentine paraffine. Finally the specimen was imbedded in paraffine.

[1] "Lehrbuch der chirurgischen Krankheiten des Ohres," 1885.
[2] *Arch. f. Ohrenheilk.*, Bd. xi.

The membranous exudation covering the mucous membrane of the tympanum was now seen through the microscope to be composed of a fibrinous network, in the meshes of which were numerous blood-cells, emigrated white blood-corpuscles, and other cellular elements, whose exact nature could not be certainly ascertained, owing to the density of the network of fibrin surrounding them, the meshes of which were so thick and so irregularly entangled as to completely obscure the finer structure and contour of the elements in question. In order better to distinguish this network (composed of fibrous tissue) from the remaining cellular structures, the above-mentioned method of Weigert for staining fibrin was employed. This method cannot be too highly recommended, and as it led to very brilliant results in our case, I deem it quite appropriate to mention it at this point. Two important fundamental rules for the staining of fibrin and micro-organisms, says Weigert, are as follows: In the first place he leans on Gram's method of treating the stained section with iodine. By this means the coloring matter is more easily extracted from the tissues and nuclei by the subsequent use of alcohol and oil of cloves, while on the other hand the bacteria retain it more obstinately than when the treatment with Lugol's solution is omitted. This method therefore offers two advantages: first, that the non-bacterial portion of the specimen may be entirely decolorized, or tinged in a contrasting color; in the second, bacteria, which would otherwise remain unstained, present themselves intensely colored. This second advantage is the more important, in that it demonstrates that the appearance of the bacteria not only depends upon the disappearance of the staining matter, but also upon the treatment with iodine, for in places where no nuclei are present, the bacteria are visible only after the application of this drug. The new method therefore confirms the importance of iodine in this sense.

The second principal point of Weigert's method is that some substance must be used which has a greater affinity for those elements which are not to be tinged, as compared with those which it is desirable to stain. Weigert found

that this want was supplied by aniline oil, which was especially good in the case of the aniline dyes in question. "The specimen (hardened in alcohol) is first stained with a saturated aniline-water gentian-violet solution" (an alcoholic gentian solution is used). "If this is done upon a slide, the superfluous coloring matter is removed by blotting-paper and the iodine solution applied at once. After this, the specimen is again dried and aniline oil is dropped upon it. In staining fibrin it is better to mix xylol with aniline oil (2:1 aniline oil)." More oil must be added repeatedly until a well colored and distinctly differentiated preparation is obtained. If double staining is desirable, as in our case, the preparation should first be treated with any carmine, such as, for instance, borax-carmine, and then stained as above. This method is especially useful, says Weigert, owing to the decided contrast offered by the coloration of the fibrin, which takes an intense blue, while the bacteria, etc., are quite dark, almost black. No other elements which might be mistaken for fibrin are stained, excepting a few nuclei or threads of connective tissue, and these are so faintly tinged that there is no possibility of error. Coagulation-necroses do not take the color.

The hyaline masses of pharyngeal diphtheria are stained, and show a fibrinous network which could not be analyzed without special staining methods. The specimens stained by the above methods presented the following appearances under the microscope (see Plate II.): A tangled mass of blue threads were seen upon the reddened mucous membrane, which were recognized as fibrin beyond a doubt owing to the intense blue color. In the meshes of this thick network lay a number of scattered white corpuscles. Between the meshes are also seen numerous bluish-black granular foci composed of micrococci. Furthermore, numerous threads of fibrin were observed which were dotted with bluish-black points, arranged so as to look like chains. These black points seemed also to be micrococci. The mucous membrane itself was peculiar in appearance. The epithelial layer seemed to have disappeared almost entirely, and only here and there were small heaps of epithelial cells to be seen. Isolated epi-

thelial cells lay dispersed over the surface imbedded in fibrin. Some of these epithelial cells are quite different in their appearance from others. The nuclei in some instances are intact; in others only the nuclear contour is observable, and is quite faint, while in still others no nucleus is visible, and the cell body is filled with coagulated (in some cases granular) protoplasma, as is seen in coagulation-necrosis. Many epithelial cells show a very faint contour, as though washed out. Here we have the different stage of necrotic decomposition before us. The fibrinous structure is thickly knotted around these necrotic cells, sometimes even penetrating the mucous membrane. Genuine connective-tissue nuclei are seen dispersed here and there, while the connective tissue itself is so pushed apart by the encroaching fibrin that there remain but a few isolated bands, which seem to be very tightly compressed. Large spaces appear where the cells have been pressed out or the connective tissue torn away, and these are filled with a dense fibrinous network. Quite a number of pus cells have invaded the entire mucous membrane, the fibrin and pus cells penetrating to the deepest portions of the mucous membrane lying close to the bone; but these deeper layers do not show as much destruction as the superficial portions. The mucous membrane of the tympanum offers us then the picture of the devastation caused by a genuine diphtheritic or fibrino-necrotic inflammation. The connective tissue is rent asunder and strongly infiltrated with fibrin and pus; large spaces exist owing to loss of substance, and necrosed and disintegrated epithelial cells, whose contours are only faintly visible, are seen to be filled with a peculiar homogeneous protoplasma, and surrounded by fibrinous fibrous-tissue membranes. To what extent the micrococci above described are concerned in this process is difficult to decide until their specific influence has been demonstrated by culture and inoculation of the mucous membrane in the living subject. It is not improbable that the disturbance in the connective-tissue fibres and the great infiltration may have caused a certain amount of compression of the blood-vessels, thus shutting off the supply of nutrition and

leading to the decomposition of the epithelial cells. The tympanic mucous membrane, although apparently of like consistency and appearance throughout the whole preparation, showed many variations when viewed under the microscope. The fibrin threads in many specimens were superficial, merely lying upon the surface, with absence of the epithelial layer and deeper infiltration of the mucous membrane itself with pus cells, having, in short, the appearance of a pure fibrinous, croupous inflammation. In our case it is probable that the diphtheritic necrosing process existed simultaneously with this, and that the latter was merely the preliminary stage of the former. The comparatively slight evidences of inflammation in the Eustachian tube as compared with the pronounced affection of the pharynx and tympanum leads us to infer that the morbific agents reached the tympanic cavity by way of the blood-vessels or lymph channels, as their passage through the tube itself would most certainly have been attended by extensive infection of the tissues of that region. In two cases Burckhardt-Merian[1] likewise noticed in the living a similar affection of the tympanic cavity without marked implication of the Eustacian tube. There is no doubt that either streptococci or bacilli, as first described by Klebs, play an important part in the ætiology of this disease, although Löffler's[2] inoculations failed to prove with certainty that any one micro-organism is the undoubted causative factor of diphtheria. According to Moos[3] of Heidelberg, streptococci are found in the labyrinth and pyramid of the petrous bone in diphtheria, but he believes they are accidental, and not the specific micro-organism of diphtheria. Most of the histological observations which have been made of croupous or diphtheritic inflammation of the tympanic mucous membrane were cases of the so-called otitis media diphtheritica, as a complication of naso-pharyngeal diptheria, and our own case is the first one of true diphtheritic inflammation of the

[1] Sammlung klin. Vorträge von Volkmann, No. 182. Ueber den Scharlach in seinen Beziehungen zum Gehörorgane—von Burckhardt-Merian.

[2] "Mittheilungen aus dem Kaiserl. Gesundheitsamt," Bd. ii., S. 489–499.

[3] Untersuchungen ueber Pilzinvasion des Labyrinths im Gefolge von einfacher Diphtherie.—*Zeitschrift f. Ohrenheilk.*, Bd. xvii, 1887.

mucous membrane of the middle ear (as proven by us microscopically) which has been firmly established histologically. The complication just mentioned seems in many cases to be a simple otitis media suppurativa, and not of diphtheritic character. This would seem to be explained by the fact that primary pharyngeal diphtheria is not very often accompanied by implication of the ear. This point is maintained by the Vienna specialists.[1]

On the other hand, it has been demonstrated microscopically that otitis media crouposa is of frequent occurrence in scarlatinous pharyngeal diphtheria, as was first pointed out by Wendt.[2] He firmly establishes the occurrence of croupous inflammation of the tympanic mucous membrane, finding in many cases an undoubted croupous membrane upon the hyperæmic mucous membrane (which was covered with elevated papillæ and extensively infiltrated with cells) and ossicles of the ear. It is impossible to decide whether this was the same process which we have designated above as croupous, with a superficial fibrinous exudation, or whether it was a genuine diphtheritic necrotic inflammation.

Kupfer[3] has also proven that croupous inflammation of the tube and tympanum may occur in pharyngeal diphtheria. Wreden[4] found diphtheritic inflammation of the tubal mucous membrane in diphtheria of the pharynx, the diphtheritic exudation extending from the ostium pharyngeum to the isthmus tubæ. His description, however, does not clearly explain whether the disease was purely fibrinous or fibrino-necrotic. Trautmann's[5] observations of a severe and pronounced case of pharyngeal diphtheria with aural complications seem to have established the presence of a real diphtheritic inflammation of the middle ear; it was not positively proven, however, that it was the necrotic variety.

The tympanum is filled with a soft, partially decomposed, dirty grayish-red coagulum, in which the ossicles were com-

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[1] Politzer, "Lehrbuch der Ohrenheilk," 1887.
[2] *Arch. f. Heilkunde*, Bd. xi., u. xii.
[3] *Arch. f. Ohrenheilk.*, Bd. xi., S. 20.
[4] *Monatsschr. f. Ohrenheilk.*, Bd. ii., S. 8.
[5] Embolische Erkrankungen des Gehörorgans.—*Arch. für Ohrenheilk.*, Bd. xiv.

pletely imbedded and which had to be lifted out with a needle. The tympanic mucous membrane very much swollen, and shows hemorrhagic infiltration. The cartilaginous tuba is covered with a smeary yellowish-white mass, which, being removed, shows the underlying surface smooth, moderately swollen, and hyperæmic. *Mt* moistened with serum, short and long processes very indistinct, and a perforation about the size of a pin-head in the posterior lower quadrant. The appearances are the same on both sides. The vessels of the deeper layers of the mucous membrane and promontorium are very much injected. In the subepithelial layers numerous red blood corpuscles are discovered, still clinging to the walls of the vessels from which they had made their exit, leading us to infer implication of the vessel wall. While in most places the epithelium was still intact, it was destroyed here and there, and at these points there were collections of micrococci, which had commenced to insinuate themselves into the superficial layers of connective tissue, following exactly the spaces between the different layers. The mucous membrane itself was very much thickened and infiltrated with round cells. Of all the many papers published by different observers upon croupous or diphtheritic inflammation of the middle ear, Loring's[1] case seems to be most like my own. The tympanic mucous membrane was covered in spots by pseudo-membranes about 1 *mm* thick, which could not be detached, and was swollen, loosened, and bluish-red in color. The microscope showed fibrin, pus corpuscles, ciliated cells, granulation tissue, and red blood-corpuscles, irregular branching homogeneous bodies, and, finally, peculiarly metamorphosed epithelial cells, such as have been described in croupous and diphtheritic membranes and demonstrated in my own case. Moos[2] likewise saw similar appearances in the middle ear. The pseudo-membranes were of fibrillar structure, the spaces of which were filled with coagulated fibrin and granular cells.

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[1] *The American Journal of Otology*, vol. iii., No. 2.

[2] Untersuchungen über Pilzinvasion des Labyrinths im Gefolge von einfacher Diphtherie.—*Zeitschr. f. Ohrenheilk.*, Bd. xvii.

In other cases, Moos, at the time of his observations upon bacterial invasion of the labyrinth following diphtheria, found evidences of simple catarrh. In conclusion I would venture to suggest that with the aid of Weigert's excellent method for the staining of fibrin, many new results may perhaps be obtained, and that the subject presents fruitful soil for further investigation.

Explanation of the Illustrations. (*On Tab. II.*)

FIG. 1.—(Low power.)

a. Fibrin (blue).

b. Mucous membrane of the tympanum (red).

FIG. 2.—(High power.)

a. Fibrin.

b. Chains of micrococci.

c. Heaps of micrococci.

d. Epithelial cells scattered in the fibrin.

e. Connective tissue.

f. Blood cells.

g. Completely necrotic epithelial cells.

h. Epithelial cells with intact nucleus.

i. Connective-tissue cells.

k. Spaces in the torn connective tissue, filled with fibrin.

l. Necrotic epithelial cells with granular protoplasma.

m, m. Epithelial layer of mucous membrane of the tympanic cavity, faintly indicated by more marked aggregation of epithelial cells, which show commencing necrosis.

OSSIFICATION OF THE AURICLE IN CONSEQUENCE OF PERICHONDRITIS SERO-PURULENTA.

By H. KNAPP.

OSSIFICATION of the auricle is so rare that formerly its occurrence was altogether denied, and even to-day I find no more than three cases on record. They referred to physiological ossification in old people. The first, and best described, was published in the year 1866 by Prof. Bochdalek[1] of Prague. He discovered this rare abnormity in both ears of a man from 65 to 70 years old, whose cadaver was used for dissecting at the Anatomical Institute. On close inspection and palpation of both auricles no trace of any pathological process could be found in the skin and perichondrium.

In the left ear the ossification occupied the greater part of the helix, namely 1 inch by 0.3 inch in extent. Most intensely ossified, however, was the antihelix with its two limbs and the fossa between them. In these places the formation of bone was continuous. In the lower parts, and also in the cartilage of the ear canal, smaller disconnected patches of bone were found.

In the right ear ossification was noticed only at the upper part of the antihelix. The other parts of the auricular cartilage betrayed by their rigidity the beginning of ossification.

The microscopical examinations revealed true bone substance with irregular arrangement of the corpuscles. From these conditions Bochdalek draws two conclusions:

[1] "Prager Vierteljahrsschr.," 1866, i., p. 33.

1. The auricular cartilage may ossify, even without marks of irritative processes.

2. The statements of earlier and some modern writers concerning fractures of the auricular cartilage do not lack foundation.

The second case was incidentally mentioned in a paper by Voltolini, in the year 1868.[1] This author says: "Only once, thus far, have I come across a patient (a man of about seventy years) in whom the auricular cartilage was ossified, namely its whole posterior part. This occurrence, I think, is very rare, for aurists have examined thousands and thousands of ears, and found ossification but very seldom."

The third case was described by Gudden,[2] in 1870, as follows (p. 467 *l. c.*): "Thus far I have met only with one case of primary ossification. It occupied almost the whole extent of both auricular cartilages in a man of about seventy years of age. The ears felt like a board of wood, they were stiff and immovable. There was no evidence of a previous injury."

The question of the ossification of fibro-cartilage seems to have been treated experimentally in former years. "Rayer,[3] on irritating the auricular cartilage of a rabbit, noticed first that the cartilage was softened, secondly that a yellow substance was deposited here and there in its tissue, in which subsequently a chalky mass, and finally real ossification developed."

Ossification of the auricle as the consequence of morbid processes in man is, as far as I have searched the incident literature, nowhere mentioned. The publication of the following case should therefore need no apology.

M. O. S., aged twenty-two years, consulted me in January, 1889, and gave, in his own writing, the following history: "My ear first began to trouble me, if I remember rightly, in the summer of 1882, when I was a boy of fifteen. I noticed, one morning about the beginning of August, two little swellings, side by side,

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[1] "Die Krankheiten des äusseren Ohres," p. 1. *Monatsschr. f. Ohr.*, Year ii., No. 1.

[2] "Ueber den mikroscopischen Befund im traumatisch gesprengten Ohrknorpel. *Virchow's Arch.*, Bd. li., p. 457, etc.

[3] Cited by Bochdalek, *l. c.*

on the very edge of my ear, which I took to be the bite of an insect. They did not itch, were quite soft, and there was very little redness, if any, about them. In a few days the two swellings had merged into one, which seemed filled with some fluid. The swelling was soft, the fluid moved readily from one part of the swelling to another. There was no serious discomfort, and nothing was noticeable on the ear except its change of shape, only I worried about it—and probably worried it a good deal. I showed it to Dr. Hy. Russel, in Quebec. He said to wait three weeks, and see if it did not go away by itself. In three weeks there was no perceptible change either for better or worse. Then he lanced it. What came out was, I think, simply water. After a week the wound was nearly healed, the swelling about the same shape and feel. Dr. Russel reopened the wound, and told me to keep it open every night with a darning-needle. I used to do so; a little water used to come out, but there seemed to be a cavity inside with nothing in it. Shortly after I returned to school. The wound healed; the swelling did not materially lessen. I may have burst it in foot-ball, or romping at school. At any rate, a month or so after my return it began to swell very rapidly to an enormous size, grew red, hard, heavy, and very painful. I showed it to the school physician, Dr. Robertson. He said there was a bad abscess there, and lanced it. A great deal of matter came out. After that it used to be poulticed several times a day with linseed for some time. Finally it returned to about the condition it was in before the abscess. The ear was losing its feeling of hollowness and becoming solid, but still soft. Exactly when it hardened I cannot say. This was shortly before Christmas, five months after the beginning of the affection. The next summer, when at home, I showed it to Dr. Russel again; it was then as hard as a rock. The next winter (1883–84) it was so hard that a fur cap which I used to pull over the ear, used to cause so much pain sometimes that I had to remove it. Dr. Russel spoke of operating upon it, but the operation was put off from time to time and never performed."

When I saw the patient, his hearing was good, but the auricle presented the peculiar deformity which, as the result of perichondritis, has been repeatedly described in these ARCHIVES and elsewhere. It was thickened and contracted, the natural contours replaced by irregular elevations and depressions. Most conspicuous was a cylindrical intumescence which extended from the upper anterior

part of the pinna transversely backward and then curved down, corresponding to the antihelix, but filling also the fossa of the helix. It felt hard like wood, and could not be bent in any direction. There was a certain rigidity also in the other parts of the auricle, except in the lobule, which had the ordinary consistence. The unyielding hardness had convinced me of the presence of ossification in the auricle, and I advised the patient to have the ridge in the upper and posterior parts, the chief deformity, removed. He consented, and I performed the operation February 6, 1889, at the New York Ophthalmic and Aural Institute.

I first made an incision through the skin and subcutaneous tissue, down to the hard (bony) part of the tumor, along its upper and posterior sides; then another, parallel with the former, more in front of it, joining its upper and lower ends, thus circumscribing a narrow strip of soft tissue which corresponded to the crest of the cylindrical ridge. I dissected the neighboring tough tissue from the bony mass on both sides, seized this mass with a strong pair of forceps, and cut it out with bone scissors in its whole length. In this way I removed the bulk of the tumor, exsecting piecemeal smaller masses, especially at and between the limbs of the antihelix where the growth was broad. The bony mass which had been removed was about one and a half inches in length, and four lines in its transverse diameter, ending with a rounded tip below, but broadening fork-like in the region of the intercrural fossa. After the removal of the bone there was considerable loss of substance, for the bone reached close to the posterior surface of the pinna. This loss of substance, after careful union of the edges of the wound with each other by numerous silk sutures which were passed through the bottom of the wound, had the advantage of producing a groove which restituted the fossa of the helix. The wound healed by primary union, and the patient was discharged cured in six days.

The deformity was greatly diminished. Instead of the round, misshapen mass caused by the horizontal piece of bone, the ear now had resumed its oblong form with a fair indication of the natural ridges and depressions. A year after the operation, the patient, on my inquiry, wrote to me as follows: "The ear looks now about the same as when you last saw it. It presents a wrinkled appearance, is somewhat thicker than the other, but I do not think it is noticed much. There is still, I think, a little piece of bone at the very top of it."

The anatomical examination of the specimen showed that there was real bone substance, compact in some places, cancellous in others, and osteoid at the margins. In many places it was soft enough to be cut with a razor. Such specimens presented Haversian canals surrounded by concentric layers of bone corpuscles with numerous intercommunicating offsets—well developed *compact bone substance.* (See the accompanying drawings, fig. 1.) In other places there was

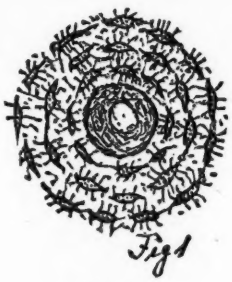

FIG. 1.

a system of broader marrow-spaces, filled with a network of connective vascular tissue and fat cells, (*a*, *b*, fig. 2) bordered by broader and smaller trabecles of true osseous substance (*d*, fig. 2)—*cancellous bone.* In other places again large islets were

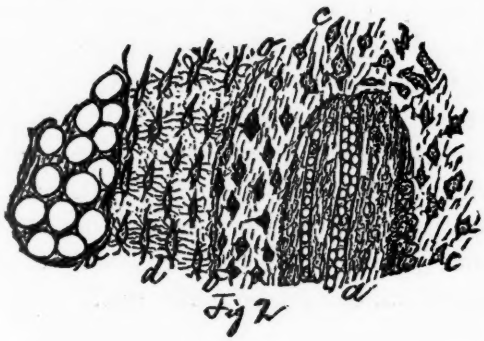

FIG. 2.

seen to lie in connective tissue or in reticular cartilage, showing small ragged cells pretty regularly scattered through a homogeneous granular matrix—Virchow's *osteoid tissue* (*c*, fig. 2; *n*, fig. 3). This tissue was separated from the reticular (yel-

low or elastic) cartilage (*m*, fig. 3) by a wall of irregular, lumpy masses—the line of ossification (*p*, fig. 3). The reticular cartilage was covered by the perichondrium and the common integument.

We have therefore before us a typical example of ossification of the reticular cartilage of the auricle. As the product of an inflammatory process in man it has, as far as I know, not yet been described, for the three cases cited at the beginning of this communication were examples of senile ossification. As there are no unique cases, we may expect to find ossification in the auricle in chronic irritative processes,

FIG. 3.

chiefly in the two kinds of perichrondritis, the sero-purulent and the hemorrhagic (othæmatoma), if we direct our attention to them. Ossification of pathological products—I may cite as an example the fibrous exudations of the choroid—commonly is a chronic process, met with a number of years after the inception of the primary affection. We must therefore look for it not in recent, but in old cases of perichondritis of the auricle. In our case eight years had elapsed before the ossification was diagnosticated; at what period after the beginning of the inflammation it had set in, cannot be made out.

REPORT ON THE PROGRESS OF OTOLOGY DURING THE FIRST HALF OF THE YEAR 1889.

I.—NORMAL AND PATHOLOGICAL ANATOMY, HISTOLOGY, AND PHYSIOLOGY OF THE EAR AND NASO-PHARYNX.[1]

By A. BARTH, Berlin.

Translated by Dr. Max Toeplitz, New York.

A.—ANATOMY.

a.—HEARING ORGAN.

1. Loewe, Ludwig, Berlin. A method of making casts of plaster-of-Paris of the external meatus and of the drum membrane in the living. *Monatsschr. f. Ohrenheilk.*, etc., 1889, p. 49.

2. Liebenmann, F. The injection of the osseous canals of the aquæductus vestibuli et cochleæ with Wood's metal. Contribution to the knowledge of the vascular canals of the osseous labyrinth. Reprint from the *Transact. of the Naturforschende Gesellsch.*, at Bâle, Part viii., No. 3, p. 672.

3. Prof. Dr. Schwalbe, Strassburg. Darwin's "Pointed Ear" in the human embryo. With seven illustrations. Reprint from the *Anatom. Anzeiger*, 1889, p. 176.

4. Sutton, S. Bland, F.R.C.S., assistant surgeon Middlesex Hospital, and Wilson, Erasmus, lecturer Royal College of Surgeons, England. On branchial fistulæ, cysts, diverticula, and supernumerary auricles. *Jour. of Anat. and Physiol.*, vol. xxi., p. 299.

5. Schimmelbusch, C. The causation of furuncles. (From Prof. Schwartze's aural clinic at the University of Halle.) With two plates. *Arch. f. Ohrenheilk.*, vol xxvii., p. 252.

[1] The papers of which the titles only are given were not at the disposal of the reviewer.

6. LINDT, W. A new pathogenic mould from the human external auditory meatus. *Arch. f. experim. Path. u. Pharm.*, vol. xxv., 3 and 4.

7. COPE, E. D. The ossicula auditus of the batrachia. *Amer. Naturalist*, vol. xxii., 5, p. 464.

8. HABERMANN, F. I., lecturer on otology at Prague. Contribution to the pathogenesis of otitis purulenta. (From Prof. CHIARI'S Path.-Anatomical Institute at the German University of Prague.) *Arch. f. Ohrenheilk.*, vol. xxviii., p. 219.

9. GRADENIGO, JOSEPH, lecturer on otology at the University of Padua. Contribution to the pathological anatomy and to the pathogenesis of otitis sclerotica. *Ann. des mal. de l'oreille et du larynx*, December, 1888, p. 629.

10. KOERNER, O., Frankfort-on-the-Main. Contribution to the knowledge of the so-called dehiscences at the tegmen tympani. *Arch. f. Ohrenheilk.*, vol. xxviii., p. 169.

1. Gelatine, agar-agar, glycerine, and water are mixed in such a manner as to become fluid at a temperature of 60° C. The mixture remains fluid when cooled to 50° C. The external auditory meatus, previously oiled, is filled with this mixture, which, when cooled, is removed as a gelatinous cast with the syringe under strong pressure. From this negative cast a positive reproduction of the drum membrane and external meatus can be made by a cast of plaster-of-Paris in the well-known manner.

2. The rather complicated procedure brought to view the following canals and their relations, viz.: Both aqueducts, besides the aquæductus cochleæ, Contugno's venous canal, together with another canal arising from the fossula fenestræ rotundæ (canalis accessorius II. aquæductus cochleæ). They enter through the apertura ext. aquæd. cochleæ, the sinus petrosus inferior. For the aquæductus vestibuli also, the constant occurrence of a special vascular canal could be demonstrated (canalis accessorius acquæd. vestibuli). On the macerated petrous bone some Haversian canals of the spongiosa, limiting the lābyrinthian capsule, communicated with the lumen of the semicircular canals.

3. In human embryos, from four to seven months, a genuine point, analogous to that of many apes and lower mammals, can be demonstrated. At this period the auricle resembles closely that of an animal. From the eighth month the aural fold

undergoes a process of reduction, consisting essentially in the rolling inwards of the aural margin and in a more marked development of the antihelix system. Darwin's "point," analogous to the animal point, can still be demonstrated in most adults, and should not be considered as teratological, but as an original formation. In order to prevent Darwin's "point" from being mistaken for the satyr- or vertex-point of the ear, the author proposes for the latter the name pseudo-point.

4. The authors give, in addition to a general synopsis of the malformation of the ear, two cases of their own observation: a fistula in the lobule, and aural appendices with simultaneous branchial fistulæ. The mode of development is explained according to His.

5. The author, originally intending to treat of the aural furuncle only, extended his examinations to furunculosis in general, finding always the same relations. He succeeded, like Garré and Bockhart, in producing impetiginous pustules and typical furuncles by rubbing a pure culture of staphylococcus into healthy skin. The individual used for the experiment was moribund, thus enabling the author to obtain the infected piece of skin after twenty-four hours for examination. The author, in addition, rubbed a pure-culture into the skin of a recently amputated limb, which was also subjected to examination. The staphylococci were found to have penetrated the hair follicles, then proceeding onward before they extend laterally and cause necrosis. They seldom enter primarily the sudoriferous and sebaceous glands. When the furuncle is inoculated the epidermis remains intact. If the latter is injured, a phlegmon or an abscess more readily develops. The same result holds good for spontaneous furuncles, viz.: those produced by artificial inoculation, according to the author's examinations. The skin remains healthy, when a pure-culture is simply placed upon it, without being rubbed into it. Two conditions, therefore, are necessary for the development of a furuncle: first, the presence of pyogenous streptococci upon the skin; secondly, the rubbing into the latter.

6. The author received from Prof. Valentin, for examination, a mould mycelium from the external auditory meatus of a patient. LINDT, according to its appearance and to that of his own cultures, was inclined to consider it as aspergillus fumigatus. But perithecia soon developed, which do not occur in aspergillus. It

was thus identified with eurotium. Rabbits inoculated hypodermatically with spores, died sooner or later with the well-known phenomena of nephritis. The author, therefore, named the mould eurotium malignum. A full description of the mould and its cultures is found in the original.

8. The very interesting pair of petrous bones were taken from a child, ten years of age, in whom, a day before death, there was noticed a serous discharge from one ear. Microscopically the same changes of a recent acute otitis media were found in both ears. In the external meatus grayish-white, purulent masses; epidermis macerated, partly missing; drum membrane intensely reddened; dura extremely vascular; middle ear filled with grayish-red pus; mucous membrane extremely swollen, dark-red hemorrhages here and there. Microscopically the mucous membrane presented at places the appearances of an acute irritation; at others the epithelium was indistinct or missing, and the superficial layers were interspersed with cocci; at others the cocci, arranged in larger groups, had further penetrated the tissue, which presented the appearances of necrosis. Similar changes were found in the tympanic cavity, also in the drum membrane, in the antrum mastoideum, in the Eustachian tube, and in the naso-pharynx. The internal ear was free. The staphylococcus pyogenes aureus should be considered as the causa morbi of this case.

9. GRADENIGO examined two pairs of petrous bones of individuals who had suffered during life from sclerosis of the middle ear. The examination showed nearly the same result in all four specimens. The auditory nerve and the inner ear were normal. The mucous membrane of the middle ear was thin, and consisted principally of delicate fibrillæ; the epithelial covering was well preserved; in this a few blood-vessels, with thin walls; at the latter, neither thickening of the adventitia nor accumulation of cells. Various membranes and bands were found. They consisted of connective-tissue fibres and were destitute of cells. They contained blood-vessels and were covered on either side by an epithelial layer. *But none was attached to the inner surface of the drum membrane.* The joints of the chain of ossicles were normal. Gradenigo, attributing to these membranes a certain amount of importance, follows up the development of the middle ear. The examinations show that, according to the statements of former investigators, various membranes and bands, with more or less constancy, are formed in the middle ear during the period of

development. The membranous connection between the horizontal limb of the incus and the posterior outer tympanic wall (40 : 50) is most frequently found ; then follows one or two membranes between the tendon of the tensor tympani and the anterior and upper wall of the tympanic cavity (33 : 50) ; the vertical limb of the incus, with the chorda tympani (31 : 50), etc. But none of the membranes are connected with the inner surface of the drum membrane. The membranes encountered at this place are always due to inflammation. It is true that from these results of examination the nature of sclerosis of the middle ear, principally the anchylosis of the ossicles, which is more frequently described, cannot be sufficiently explained. The author is convinced, however, that these membranes and bands remaining from the normal development deserve our consideration for the explanation of the sclerosis, and that we should take due notice of this condition principally in those cases in which in the same family several cases of sclerosis of the middle ear occur.

10. In a former paper the author treated of the different location of the sinus in dolichocephali and brachycephali. Similar relations to those described therein are found on the osseous tegmen tympani. In dolichocephali it is mostly several millimetres in thickness, and contains frequently spaces filled with air, whilst in brachycephali it is mostly thinner, frequently transparent. As to the " dehiscences " in the tegmen tympani, among 39 dolichocephali, *none* presented an opening in the tegmen tympani proprium, but among 92 brachycephali, 9 were found with " dehiscences " in the tegmen tympani proprium. One skull presented an abnormity on either side. Osseous foramina, which do not lead directly into the tympanic cavity, but into other cavities of the petrous bone, show a different relation. They are approximately the same in either form.

b.—NASO-PHARYNGEAL CAVITY.

1. SIEBENMANN, F. A case of mould mycosis on the roof of the pharynx. *Monatsschr. f. Ohrenheilk.*, etc., 1889, p. 73.

1. Up to date only one case of mould perforation on the roof of the pharynx in the living was known (Schubert). The specimen which SIEBENMANN had received for examination was taken from a woman, forty-nine years of age, with a history of syphilis of the naso-pharyngeal cavity. Upon the roof of the pharynx, at the usual seat of the pharyngeal tonsil, a crust, 2.5 *cm* in diameter,

was found, the free, lower surface of which was covered by a continuous grayish-green mould mass, with whitish spots. It smelled mouldy, was 5 *mm* in thickness in the centre, and consisted of alternate layers, formed either by fructifying mould masses or by a mass of thallus threads, leucocytes, epithelium detritus, cholesterin crystals, etc. The first-mentioned gray layers contained aspergillus fumigatus and nidulans, the others white mucor corymbifer. These mould masses certainly existed during life. The lungs were free from mycosis.

B.—PHYSIOLOGY AND PHYSICS.

c.—HEARING ORGAN.

1. GELLÉ. The importance of the chain of ossicles in the transmission of sounds. Soc. de Biologie, October 13, 1888. (Rev. in the *Revue mens. de laryng. d'otol.*, etc., 1889, p. 164.)

2. EWALD, J. R., Strassburg. Contribution to the physiology of the semicircular canals. *Tagebl. der 61. Versamml. deutscher Naturforscher u. Aerzte zu Köln*, 1888, p. 74.

3. MARTINI, T. Rapidity of sound in fluids. *Atti del R. Ist. Ven.* (6), vi., p. 87. (Rev. in the *Beibl. zu Wiedemann's Annal.*, vol. xii., p. 566.)

1. In holding a vibrating tuning-fork over a membrane which has been connected with one ear, *e. g.*, with the left, the sound is perceived on this side only. If we then connect the membrane with a solid body which is in communication with the right ear, the sound is perceived on the right side only. This simple experiment does not alone explain the physical fact that solid bodies conduct sounds better, but it demonstrates the important part played by the ossicles in the conduction of sound.

2. The author concludes from former observations that the effusion of the fluid after opening the semicircular canals is the cause of the subsequent disturbances of mobility. In order to test this view, he opened a semicircular canal without injuring the membranous canal. He then occluded both openings of the osseous canal with a gold amalgam filling. Secondary symptoms of irritation never followed. We may just as well open all three canals instead of one, and then occlude the six openings by fillings. The animals showed only a lack of strength in all striated muscles, inclusive of the lingual, laryngeal, and maxillary muscles. The animals operated upon in the above described manner perished, with the symptoms of a most severe muscular atrophy.

3. The result of the experiments is briefly as follows : The sound is transmitted in *water* at 3.9° C. 1599 *metres* (?), at 13.7° C. 1437 *m*, at 25.2° C. 1457 *m* in one second ; in 11 % alcohol at 4.4° C. 1496 *m* ; in saturated solution of table-salt at 14.7° C. 1661 *m* ; in saturated solution of nitrate of soda at 15.3° C. 1650 *m*, etc. The most important conclusions arrived at are as follows : 1. The velocity of sound in water increases within the ordinary limits of temperature, with the temperature. 2. The velocity of sound in other fluids decreases with the increasing temperature. 3. The solution of gaseous, fluid, or solid bodies in water increases the velocity of sound ; this holds good also for the other fluids. 4. In salt solutions the velocity of sound increases in proportion to the amount of the dissolved salt. 5. Different salt solutions of the same degree of density exhibit different velocities of sound. 6. If the same quantity of salt is dissolved in the same amount of water, markedly different figures result from salt to salt. 7. If the same quantities of salt, with or without water, are dissolved in water, the velocity of sound is greater in the former instance than in the latter.

II.—PATHOLOGY AND THERAPEUTICS.

By A. HARTMANN, Berlin.

Translated by Dr. Max Toeplitz, New York.

GENERAL LITERATURE.

1. Report on the work done at the R. Aural University Policlinic at Halle a. S. from January 1, 1887, to March 31, 1888. By Drs. Reinhard and Ludewig. *Arch. f. Ohrenheilk.*, vol. xxvii., pp. 201 and 281.

2. The Bradford Eye and Ear Hospital. Report for the year ending December 31, 1888.

3. Sixteenth Biennial Report of the Illinois Charitable Eye and Ear Infirmary. Chicago, 1888. Ear Department. Surgeons : Drs. S. S. Bishop and J. E. Marshall.

4. May, Chas. H. A *résumé* of experience at the aural clinic of Prof. Hermann Schwartze, in Halle, Germany. *N. Y. Med. Jour.*, May 25, 1889.

5. Netter. Investigation of the condition of the ear in infants (*Recherches sur l'état de l'oreille chez les enfants*). Soc. biolog., April 20, 1889.

6. EDIN, CANE. The hearing of seamen. *The Lancet*, 1889, No. 15.

7. GELLÉ. Effects of the telephone upon the hearing organ (Actions du téléphone sur l'organe de l'ouie). Soc. de biolol., June 1, 1889.

8. MOURE, E. I. The influence of sea air upon ear affections (De l'influence de l'air de la mer sur les maladies de l'oreille). *Revue de laryngol.*, etc., 1889, No. 5, cp. ; these ARCHIVES, vol. xix., p. 289 (German edition).

9. NIMIER. Effects produced upon the ear by the report of fire-arms (Des effects produits sur l'oreille par la détonation des armes à feu). *Gaz. des hôp.*, 1889, No. 50.

10. STEIN, STANISLAUS VON, Moscow. Contribution to the knowledge of bone-conduction. *Arch. f. Ohrenheilk.*, vol. xxviii., p. 201.

11. HOUGHTON, H. C. The induced current of electricity in the treatment of middle-ear disease. *Jour. of Ophthalm., Otol., and Laryng.*, Jan., 1889.

12. KRETZSCHMANN, F., Halle. The employment of some modern remedies in otology. *Arch. f. Ohrenheilk.*, vol. xxviii., p. 68.

13. Prof. WOELFLER. Contribution to the knowledge of the toxic action of cocaine. *Wiener med. Wochenschr.*, 1889, No. 18.

14. ERSKINE, JAMES, Glasgow. Deafness and deaf-mutism in relation to speaking and lip-reading. *Provincial Med. Jour.*, April, 1889.

15. ENGELMANN, B. Deaf-mutism ; its pathology, causes, and treatment. *Med. Record*, November 3, 1889.

16. COËN, RAFAEL, Vienna. Special treatment of stammering and of allied disturbances of speech. Published by Ferd. Enke, Stuttgart, 1889.

1. During the fifteen months over which the report of the aural clinic extends fifteen hundred and eighty-three patients were treated. A great number of histories were added to the statistical report. The following modern methods and remedies were used : 1. Massage in exudation of the middle ear, by stroking from the mastoid process to the shoulder, morning and evening, every five minutes. The results were quite satisfactory. Exudations, which formerly were treated without success, are said to have rap-

idly disappeared. 2. A double ball, worked by a treadle, with a disinfecting capsule is of good service in place of Lucae's double ball, after the use of which several assistants of the clinic were seized with tendo-vaginitis. 3. Creoline proved to be entirely useless. 4. The authors cannot pass definite judgment on sozojodol. Fifty cases of mastoiditis were trephined at the clinic with seven deaths.

2. In the Bradford Hospital 590 ear patients were treated during the time mentioned, among whom were 102 cases of the external ear, 441 of the middle ear and naso-pharynx, 37 of the inner ear, and 10 of the mastoid process.

3. The total number of ear cases treated was seven hundred and eighty-five. There were thirty-six operations, the only ones of importance being two for removal of carious bone behind the auricle. SWAN M. BURNETT.

4. This is a very interesting paper, since it gives the experience of a competent critic during a six weeks' residence at one of the most important ear clinics in the world. A mere abstract would not do the paper justice. We learn in the first place that seven or eight hours a day were given to the treatment of fifty or sixty patients, which is indicative of the painstaking care with which the clinic is conducted. Prof. SCHWARTZE is not an advocate of any form of "dry treatment" of middle-ear inflammation of any kind. In certain cases, where there is a perforation of the membrana tympani, he washes out the tympanum through the Eustachian tube with a warm sodic chloride solution. Astringent solutions are applied through the meatus externus. Instead of the syringe he uses frequently a pump known as *Meyer's douche*, which is very easily manipulated. As a general rule, except in young children, the catheter is used in preference to the Politzer bag for inflation. Of course a large space is given to the consideration of operations on the mastoid, with which the name of Schwartze will always be connected. In the last eighty cases of opening of the mastoid there were only two deaths, and one of them could not be in any way referred to the operation—certainly brilliant statistics. (See above, line seven of this page. K.) SWAN M. BURNETT.

5. NETTER made numerous investigations on the ear in children under two years of age. He almost invariably found lesions in the tympanic cavity. The micro-organisms of the pus of the tympanum were identical with those of otitis in adults. Netter believes that the micro-organisms entered the tympanum through

the Eustachian tube. Gellé believes that these disturbances are found principally in young syphilitic or tubercular individuals, and that the mucilaginous pus depends upon changes of the gelatinous tissue. G. GELLÉ.

6. EDIN justly demands that the hearing faculty of seamen should be examined as well as their sight and color-sense, maintaining the importance of the former in sailing through dense fog, especially in the now more increasing speed of the vessels. He lays great stress upon the fact, that the difficulty of correctly projecting the source of sound, to which even the normal ear is subjected, exists in a much higher degree for a decreased hearing faculty. The comparative frequency of aural affections among seamen can be readily explained by the nature of their occupation.

7. GELLÉ had frequent opportunities of observing the deleterious influence of the telephone upon the hearing. This injurious influence seems to be due either to the excessive strength and closeness of the sound or to the fatigue that is caused by the attention required for this peculiar transmission of sound. There exists in all cases a certain nervous predisposition ; in some, there are found old pathological changes in the ear. The injurious influence of the telephonic sound is analogous to the well-known observations in machinists, in whom changes of the drum-membrane and of the tympanum are found, and also severe attacks of neuralgia, intense tinnitus, extreme hardness of hearing, and vertigo. The conducting and nervous apparatuses are equally affected, as well as the general nervous system. G. GELLÉ.

9. The influence of the report of fire-arms, according to NIMIER, is not exerted upon the hearing organ by the pressure upon the drum-membrane, but by the transmission of the sound-waves to the nervous apparatus. This is expressed independently by disturbances of hearing, deafness, subjective noises, and reflex lesions in regions, the centres of which are situated near the nucleus of the auditory nerve.

10. V. STEIN reports a female patient with a medium degree of deafness, and an almost normal drum membrane and free tubes. She exhibited besides some hysterical phenomena, anæsthesia and analgesia in almost the entire province of the regions supplied by the three branches of the fifth and of the glosso-pharyngeal nerves. The sensations of touch, temperature, and pain were entirely missing ; the sensation of pressure was considerably diminished. The

tuning-fork placed upon the anæsthetic areas was not perceived. After the return of the sensation of touch the sound of the tuning-fork was perceived.

11. HOUGHTON claims that he has derived more benefit from the induced current than from the constant current in the treatment of sclerosis of the middle ear. He applies one pole to a wire which enters the mouth of the Eustachian tube through a catheter, the other at the external auditory canal. General treatment is, however, not to be neglected. SWAN M. BURNETT.

12. The modern remedies, employed by KRETZSCHMANN, are as follows: 1. Bromethyl; it is applied as an anæsthetic in short and painful operations. Narcosis sets in rapidly, and the application, as well as the after effects, are less unpleasant than with chloroform. The disadvantages are: absence of the corneal reflex, and the uncertainty of the effect in narcosis of long duration. 2. Creoline; patients with chronic otorrhœa could not stand the drug in a stronger solution than 2 : 1,000. It must, however, be admitted that the discharges were somewhat diminished, and that the healing process was thereby favorably influenced. 3. Liquor antihidrorhoicus was successfully employed in nasal and pharyngeal catarrhs associated with hyperhidrosis pedum.

13. On account of the cases of cocaine poisoning within reach, observed by himself and others, WOELFLER believes to be justified in concluding that the disposition to poisoning upon the surface of the skull, in the face, and the adjoining cavities is by far greater than upon other places of the body. Whilst we may unhesitatingly inject five centigrammes into the extremities or the body, not more than two centigrammes should be injected into the above-mentioned parts.

14. After a general introductory on deaf-mutism ERSKINE warmly advocates the instruction in articulation and lip-reading, which should also be acquired by persons who have become deaf after school years. He reports that a society of adult deaf-mutes has been formed in Glasgow, which pays considerable attention to systematic instruction in lip-reading.

15. ENGELMANN believes that in most cases deaf-mutism may be ascribed to certain irregularities in the auditory apparatus. Marriages between near relatives he thinks a most productive cause of congenital deaf-mutism,—statistics showing such to be the fact in about twenty-three per cent. of cases of the anomaly. In the instruction of the deaf-mutes in articulation he prefers the German to the French method. SWAN M. BURNETT.

16. COËN describes in his monograph the disturbances of articulation, collectively named stammering, consisting of faulty formation or of the interchange of the sounds of speech. The author distinguishes between functional and organic stammering, subdividing the latter into central and peripheric stammering, according to the presence either of central or of peripheric disturbances of mobility of the organs of speech, or of faulty mechanical impediments. The treatment consists principally in the acquisition and practice of the correct articulation, for which practice the necessary directions and exercises are given.

INSTRUMENTS AND METHODS OF EXAMINATION.

17. KRAKAUER, Berlin. Contribution to the operation on adenoid vegetations of the naso-pharyngeal cavity. *Berliner klin. Wochenschr.*, No. 5.

18. CORRADI, CORRADO, Verona. An instrument for the treatment of adenoid vegetations of the naso-pharynx. *Arch. f. Ohrenheilk.*, vol. xxviii., p. 23.

19. VOHSEN, CARL, Frankfort-on-Main. Modification of a method of examination of the naso-pharynx and larynx *Monatsschr. f. Ohrenheilk.*, etc., 1889, No. 1.

20. COZZOLINO, Prof., Naples. Anterior rhino-tubo-pharyngoscopy with posterior electric illumination (Rhino-tubo-pharyngoscopie antérieure à l'éclairage électrique postérieur.) *Annales des malad. de l'oreille*, etc., vol. xv., p. 163;

21. COZZOLINO VINCENZO, Naples. Electrolysis or chemical electro-cautery in diseases of the nasal cavities, etc. (L'elettrolisi o. elettro-caustica chimica nelle malattie della cavità nasali, etc.). *Morgagni*, March, 1889.

22. ROTH, Vienna. The employment of the electric light in laryngoscopy and rhinoscopy. *Wiener med. Wochenschr.*, 1889, No. 10 and 11.

23. KAFEMANN, R. Electrolytic operations in the upper air-passages. Wiesbaden. Published by I. B. Bergmann.

17. KRAKAUER recommends for removal of adenoid vegetations from the naso-pharynx an instrument called "the vegetation scraper," strongly resembling the so-called oven-rake. The shaft of the instrument ends in a blade; about 1 *cm* in width and 0.75 *cm* in length, which is placed in a horizontal position, is slightly curved, and sharpened behind.

18. CORRADI'S instrument consists of a sharp finger which differs from the usual one by having thirteen holes punched out upon the posterior surface so as to give the plate the appearance and character of a small "grater." This grater is directed to be "pressed and rubbed with a certain force against the granulations."

19. VOHSEN recommends for the better demonstration of the lateral walls of the naso-pharynx during the examination to turn the atlas-epistropheus joint while the spinal column remains fixed. The person to be examined faces the physician, the shoulders being placed in an oblique position. In this way a large space is formed for the introduction of the mirror laterally and posteriorly from the spinal column, by which the opposite surface of the pharynx can be fully examined.

21. COZZOLINO describes his electrolytic instruments. The results attained by this method of treatment, principally in diseases of the nose and ear, were excellent.

22. ROTH does not consider Voltolini's method of translucidation to be very useful, at least for the nose and pharynx, and he cannot understand how the antrum Highmori is to be translucidated. His own method of translucidation, however, by which the light is conducted through a cylindrical glass rod, might answer all requirements. As to the aim reached by the method, he cannot share Voltolini's enthusiasm, for he maintains that the transmission of the light through the circulating blood prevents differentiation of the translucidated organs. Roth further describes a novel method of anterior rhinoscopy, for which the electric light in form of Leiter's panelectroscope is used, and also an apparatus with water irrigation for illuminating the naso-pharyngeal cavity (cp. illustration).

23. KAFEMANN in his lecture warmly advocates electrolysis in several affections of the nose, naso-pharynx, and larynx, and recommends a number of instruments devised by him for this purpose.

EXTERNAL EAR.

24. HERZOG, JOSEF, Graz. Contribution to the knowledge of aural reflexes due to collection of cerumen in the external auditory meatus. *Monatsschr. f. Ohrenheilk.*, etc., 1889, No. 5.

25. CHOLEWA, R., Berlin. Menthol in furunculosis of the external auditory meatus. *Therap. Monatshefte*, June, 1889.

26. GRADENIGO, GIUSEPPE, Turin. A new case of periodical bleeding from the ear with imperforate drum membrane in an hysterical person. *Arch. f. Ohrenheilk.*, vol. xxviii., p. 82.

27. POOLEY, THOMAS R. The operative treatment of a case of hyperostosis of the external auditory canal. *N. Y. Med. Jour.*, March 9, 1889.

28. JACQUEMART. Communication of two cases of exostosis of the external auditory meatus (Communication à propos de deux cas d'exostose du conduit auditif externe). *Revue de Laryng. et d'otologie*, etc., 1889, Nos. 7 and 8.

29. MÉNIÈRE, E. Injury of the right drum membrane by a twig (Blessure du tympan droit par une branche d'arbrisseau). *Annales des malad. de l'oreille*, etc., 1889, No. 9.

30. Prof. E. BERTHOLD, Koenigsberg. The first ten years of myringoplasty, together with improved methods for the cure of old perforations of the drum membrane. Berlin. Published by August Hirschwald, 1889.

24. HERZOG'S patient, a woman, who suffered from heart trouble, presented the following symptoms: a dragging sensation in the head and the nape of the neck; head fixed as by a clamp-screw; at times vertiginous symptoms, principally in moving the head; indescribable precordial pangs; palpitations; feeling of stopping of the heart; frequent headaches. After removal of a ceruminal plug, discovered accidentally, permanent complete recovery took place. Herzog believes that the vertiginous symptoms were caused by the pressure of the plug upon the drum membrane, the disturbance of the action of the heart, however, by irritation of the nerv. auricularis vagi.

25. CHOLEWA used the antiphlogistic, analgesic, and antibacterial effect of menthol for the treatment of aural furunculosis, and made investigations on the influence of menthol upon the staphylococcus aureus, which causes furunculosis. He found that the staphylococcus "did not grow, even when only 0.089 (and less) of a 10 % solution (in equal parts of glycerine and alcohol) was added to seven or eight grams of agar or gelatine in the cultures, even in extensive inoculations." Culture plates exposed to the vapor of menthol remained entirely sterile.

Cholewa's treatment of aural furunculosis consists in the introduction of firm cotton plugs moistened with a 20 % solution of menthol oil. They should be large enough to exert a slight pres-

sure upon the inflamed surrounding parts. The cotton plugs are changed every twenty-four hours.

26. GRADENIGO'S patient, a girl aged fifteen, suffered from intense nervous coryza, followed by bilateral earaches. The hysterical phenomena soon disappeared. The night before the beginning of menstruation a few drops of blood discharged from the ear; this recurred after the menstruation two to three times a day. The drum membrane was found to be normal, except for six to eight reddish spots the size of the head of a pin at the posterior lower wall of the external meatus. The bleeding ceased after instillation of bor-alcohol. There is no ground for Gradenigo's view that an otitis media was the predisposing cause of this case.

27. POOLEY'S patient was a man of thirty-five years, with exostoses in both auditory canals. Those which were removed were in the right ear, and were situated one on the upper and one on the posterior wall, closing the canal almost entirely. They were conical in shape. The removal was made by the electro-osteotome of Dr. M. J. Roberts. The operation lasted two hours, but the whole of the bony growth was removed flush to the surface of the bony canal. On cicatrization a very considerable narrowing of the canal remained for some time, but ultimately disappeared, revealing a membrana tympani of almost normal appearance. There was normal hearing for the voice; watch at twelve inches.

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28. JACQUEMART distinguishes congenital and acquired exostoses of the external auditory meatus, the latter comprising the spontaneous and traumatic. He considers syphilis as the most frequent cause, without adducing any evidence for this questionable supposition, which is as untenable as that of an arthritic or herpetic diathesis being a predisposing factor. The traumata cause exostosis by circumscribed inflammation. In this way two cases of his own observation developed. In the first case the exostosis filled the entire external meatus. An attempt to destroy it by galvano-cautery proved it to be movable and pedicillated. It could be freed by a lever from the membrane that covered it, and removed from the meatus. In the second case, that of a colleague, the exostosis was inserted with a broad basis into the posterior and anterior wall of the external meatus. An opening was made with the galvano-cautery, and normal hearing power was the result of the operation, although the drum-membrane had been injured and complications had set in during after-treatment.

29. MÉNIÈRE reports an observation of a severe injury of an ear with perforation of the drum membrane and commotion of the labyrinth entrance by a twig which had passed into the external meatus. The case was remarkable for the fact that the person was for some time completely deaf in the injured as well as in the non-injured ear. A protective spasm had taken place at the moment of the injury by functional sympathy and by synergetic accommodation. Ménière points out that this observation forms a valuable support for Gellé's views on binaural hearing.

G. GELLÉ.

30. BERTHOLD's monograph contains his results obtained in ten years with myringoplasty, and fully describes his methods used of late. We refer to our former review, and for details to the original.

MIDDLE EAR.

31. Prof. E. ZAUFAL. New cases of genuine acute otitis media, caused by the diplococcus pneumoniæ of A. Fränkel-Weichselbaum. *Prager med. Wochenschr.*, 1889, No. 6–12.

32. ZAUFAL. Appendix to the foregoing paper. *Ibid.*, No. 18.

33. BASKIN, MARIE. Clinical and experimental examinations upon secondary infection in scarlatina. *Centralbl. f. Bacteriol. u. Parasitenkunde*, 1889, Nos. 13 and 14.

34. BACON, GORHAM. The treatment of acute inflammation of the middle ear. *Med. News*, March 20, 1889.

35. Prof. IGNACE FENOGLIO, Cagliari. Infectious otitis media (De l'otite moyenne infectieuse.) *Annales des mal. de l'oreille*, etc., 1889, No. 5.

36. FOWLER, W. P. Polypus of the tympanic cavity, with very small perforation of the membrana tympani. *Jour. of Ophth., Otol., and Laryngol.*, January, 1889.

37. GODSKESEN, N. H. Affections of the chorda tympani and the plexus tympanicus in purulent inflammations of the middle ear. Copenhagen, 1888.

38. HOFFMANN, EG., Greifswald. Contribution to the pathogenesis of diseases of the brain following inflammations of the ear. *Deutsche med. Wochenschr.*, 1889, No. 10.

39. HESSLER, Halle. Acute suppuration and inflammation in the mastoid cells cured by chiselling of the cells without open-

ing the antrum mastoideum. *Arch. f. Ohrenheilk.*, vol. xxvii., pp. 185, 265 ; vol. xxviii., p. 1.

40. KÜSTER, E. The principles of treatment in suppurations of bone cavities, with especial reference to empyema of the pleura. *Deutsche med. Wochenschr.*, 1889, No. 10 and *ff.*

41. RICARD, A. The mastoid process and the trephining of it (De l'apophyse mastoide et sa trépanation). *Gaz. des hôp.*, February, 1889.

42. LACOARRET, Salies de Béarn. Two cases of mastoiditis, treated and cured by cauterizations with the thermo-cautery (Deux cas de mastoidite traités et guéris par des cautérisations au thermo-cautère). *Annales de la policlinique de Bordeaux*, vol. i., No. 1.

43. ORLOW, L. W. Trephining of the temporal bone in thrombosis of the transverse sinus. *Deutsche med. Wochenschr.*, 1889, No. 10.

44. STAKE, Erfurt. Considerations of the present condition of the treatment of chronic purulent inflammations of the middle ear, with reference to the lecture of Prof. v. Bergmann. *Berliner klin. Wochenschr.*, 1889, No. 18.

45. PURJESZ, IGNAZ, Budapest. The employment of creoline in cases of suppuration of the tympanic cavity. *Pester med.-chirurg. Presse*, 1889, No. 11.

31. ZAUFAL reports six cases, in addition to a former communication, in which he demonstrates the occurrence of the diplococcus pneumoniæ in otitis acuta media, and believes the latter to be the real causation of acute otitis media. In one case the diplococcus was diagnosticated only by microscopical examination of the secretions of the tympanum, in the remaining ones the diagnosis was confirmed by additional cultures and inoculations upon rabbits, guinea-pigs, and mice. The second case is noteworthy. In the beginning of the affection the diplococcus pneumoniæ was found in the secretions which were discharged after paracentesis. It was not found eight weeks later in the purulent discharge, which had continued during this time ; another micro-organism, viz., the staphylococcus pyogenes albus, however, was found instead, which had, so to speak, replaced the diplococcus. Zaufal calls this condition a secondary infection, which might eventually become tertiary, etc., and considers this as one of the main causes of chronic suppurations of the middle

ear. In one case the diplococcus was found in the suppuration of a mastoid abscess with an imperforate drum membrane; in another, inoculation with the expectoration of a patient with a simultaneous bronchial catarrh proved successful. Zaufal, by careful inoculations of pure cultures, made with the necessary precautions upon the mucous membrane of the tympanum of animals, has proved the diplococcus pneumoniæ to be the real cause of acute otitis media. The mucous membrane of the animals showed after death all characteristic signs of an acute otitis media, and the diplococcus could be demonstrated in the pure cultures, and also by cultures and inoculations. Zaufal has succeeded of late in proving its occurrence in the tissues of an acutely inflamed mucous membrane of the tympanum. Zaufal, after citing and discussing the remarkable cases of Weichselbaum and Netter (seven altogether), argues the question whether the normal mucous membrane of the tympanum is free from micro-organisms or not. He has, on account of his experiments, arrived at the result, that the tympanic cavity always contains germs, capable of development, although in small numbers; they perish, however, usually very soon, and become virulent only under favorable circumstances. Most cases of otitis media acuta, according to Zaufal, become infected from the naso-pharyngeal cavity.

32. ZAUFAL communicated in an appendix to the foregoing paper, that he has succeeded in producing otitis by inoculation of a pure culture of the diplococcus pneumoniæ from the above-mentioned cases upon the mucous membrane of the tympanum of rabbits and of a guinea-pig, and in proving the existence of the diplococcus in the tissues of the mucous membrane. It appears, therefore, to be proved that the inoculation of a pure culture of A. Fraenkel–Weichselbaum's diplococcus pneumoniæ, from the secretions of otitis media acuta in man, upon the mucous membrane of the tympanum of suitable animals, produces a well characterized inflammation of the mucous membrane, together with an exudation into the tympanic cavity.

33. After a brief synopsis of the results of former investigators, the author reports 92 cases of scarlatina, observed by himself, among which 23 are given *in extenso*, with the addition of post-mortems, when made. The examination comprises the blood and suppuration, the squamæ, the skin, the diphtheritic membranes, and in letal cases also the inner and pharyngeal organs. Among the complications observed in one third of the total number of

the cases, otorrhœa was found eight times, complicated in one case with erysipelas. The pus removed from the ear, after careful cleansing, contained invariably the streptococcus, in the later stages also the staphylococcus aureus and albus. It is worthy of note, that in the case complicated with erysipelas, both in the ear and in the inflamed skin, the streptococcus was found, which offered sufficient ground to the belief that either process is caused by the same agent. With reference to the special position given by some investigators to the streptococcus in scarlatina, the author believes that the peculiarities found heretofore are not sufficiently prominent as to warrant that view. Experiments upon animals, viz., introduction of a mixture of the streptococcus into the body of the animal experimented upon, yielded in most cases a positive result. The author further advocates that the streptococcus in scarlatina represents a "modification of the well-known streptococcus pyogenes of erysipelas respectively, and has a similar relation to the latter as all three kinds of staphylococcus to each other." The streptococci cultivated, *e. g.*, from the diphtheritic membranes and the skin, proved to be much more virulent than those from pus. Secondary infection in scarlatina and the malignity depend, according to the author's own words, upon the following three conditions: 1. Intense and early inflammation of the pharynx favor the invasion of secondary infecting eczema. 2. The streptococcus, on account of its predilection for the propagation in the lymph paths is under the given circumstance more suited for the invasion than other bacteria. 3. The extreme malignity of the complications is due to an increase of the virulence of the streptococcus in the organism affected with scarlatina.

34. The only important modification in the treatment of acute otitis media by BACON is the substitution of the scarification and cupping-glass for leeches. Ten cases are given in illustration of his treatment, and the instruments are figured.

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35. FENOGLIO believes that the cases of otitis media which he had observed during one month (six persons occupying the same sleeping-room) were due to infection. Among the ten persons who lived in this room, six were affected.

36. FOWLER has for many years been using a saturated solution of bichromate of potash to granulations and soft polypi of the tympanum with success.

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37. After an anatomical introduction and a brief synopsis of former clinical observations, especially those of Blau, Neumann, Brunner, Nowitsky, and Urbantschitsch, GODSKESEN reports seventy-five cases of suppuration of the middle ear observed by himself with reference to the sensation of taste, the sensibility of the tongue, and the secretory nerves of the salivary glands. He arrives at the following conclusions: The suppurations of the middle ear are frequently associated with abnormities of taste, of mucous discharge, and of sensibility of the tongue, which are explained by the affection of the nerves running through the tympanic cavity. The anomalies of taste are found at the anterior and, less frequently, at the posterior part of the tongue, and also at the soft palate. The anomalies at the anterior part of the tongue are due directly to an affection of the anastomosis between the plexus tympanicus and the facial nerve, of the chorda tympani, or, most frequently, of the nervus Jacobsonii. The anomalies at the posterior part of the tongue and at the soft palate are explained as reflex paralysis in consequence of inflammation of the nervus Jacobsonii. Among the nerves of the middle ear the nervus Jacobsonii is most frequently affected, then the chorda tympani, and finally, least frequently, the anastomosis between the facial and the plexus tympanicus. All gustatory fibres leading to the foremost portion of the tongue are located in the trunk of the glosso-pharyngeal, which they leave in order to reach the lingual, partly through the facial and the chorda tympani, partly through nervus petrosus superficialis minor and the otic ganglion. Also from the glosso-pharyngeal gustatory fibres branch off to the soft palate. The glosso-pharyngeal does not contain secretory nerves for the parotid gland. The anterior part of the tongue is supplied with sensory nerves partly by the chorda tympani, and probably also by the glosso-pharyngeal through the nervus Jacobsonii. The tongue is probably not supplied with trophic fibres by the nerves running through the tympanum. In seventeen of the observed cases the sensation of taste was completely absent on the diseased side, and in eighteen entirely preserved. The sensibility was diminished thirty-two times. The secretions from the ductus Whartonianus had ceased seven times and was decreased seven times. The discharge from the ductus Stenonianus stopped three times and was diminished five times.

VICTOR BREMER.

38. HOFFMANN describes the manner in which suppuration of the middle ear may lead to intracranial affections, either by de-

struction of the bone or by extension along the nerves and vessels. The following intracranial diseases may ensue: (1) purulent inflammation of the dura mater upon the surface adjoining the bone, eventually with formation of an abscess between the former and the bone; (2) inflammation of the large sinuses, eventually with their trombosis; (3) inflammation of the soft meninges; and (4) brain abscess.

39. HESSLER'S paper aims at directing the attention of the aurists upon a distinct affection of the mastoid process, which he calls an empyema and caries of its cells. He points out that these affections are neither characterized as direct extension of the suppuration of the middle ear through the mastoid antrum, nor due to retention of pus therein, but that they make their appearance simultaneously with the suppuration of the middle ear in those cells of the mastoid process which do not present any communication with the mastoid antrum. For these cases the opening of the mastoid is not well suited, but the much simpler operation of laying bare the empyema in the cell cavities and of removing all diseased portions. The author's statements are strengthened by the histories of eighteen cases.

40. KÜSTER demands that rational surgical treatment of suppurations in bone cavities should be carried out in the following manner: (1) That every suppuration in a bone cavity be opened at an early stage; (2) that the incision be located at the bottom of the cavity, and, at least in large cavities, be double; (3) that irrigations be confined to a minimum. Among the cavities mentioned especially, we consider the antrum Highmori (cp. below) and the tympanic cavity together with the antrum mastoideum. With reference to the latter, Küster lays down the following maxim: "A rational operation should tend to denude the bone extensively, so as to expose it to view, to remove all diseased portions and to lay bare the source of suppuration so completely as to allow its free discharge." This principle being entirely correct, we must confess that it is frequently violated. Küster's method of operation varies according to primary affections of the mastoid, in which the tympanic cavity is but little or not at all concerned, or according to primary suppurations of the middle ear with or without secondary affection of the bone. Primary affections of the mastoid process are, according to Küster: (1) the cholesteatomata, or pearl tumors; (2) the tuberculous ostitides; and (3) the acute infectious osteomyelitis. In these affections Küster operates in the following manner: Crescentic inci-

sion, 1 *cm* from the insertion of the auricle, detaching the periosteum, removal of a piece of the cortex 2 *cm* in diameter with a rather narrow, flat chisel. Softened bone below is scraped off with the sharp spoon until healthy bone is reached; overhanging margins are removed so as to enable the formation of an equally deepening fossa. In hard bones he advances gradually by removing the bone by strata. Küster's operation differs in primary suppurations of the tympanic cavity. He supplements the procedure as described above by the removal, as a matter of principle, of the posterior wall of the external osseous auditory meatus. If a part of the drum membrane and of the ossicles is still preserved, the external meatus should be opened rather close to and lateral from the drum membrane. If the tympanic cavity is filled by granulations, and the drum membrane and the ossicles are missing either entirely or for the greater part, he tries to reach the middle ear, in order to remove all diseased portions, under the guidance of the eye, with the sharp spoon. Küster's suggestion of establishing a communication with the external meatus appears in acute cases to be a superfluous complication of the operation unless the tympanic cavity is laid bare, while opening of the tympanic cavity is at any rate justified when secretions are retained therein. The retention being more frequent together with partial existence of the drum-membrane and of the ossicles, their presence therefore ought not to prevent the surgeon to desist from exposing the tympanic cavity.

41. RICARD describes at first the anatomical relations of the mastoid process. He shows that the anterior half is covered by the cartilage of the auricle, with the exception of the projection, which is entirely devoid of cartilage. The posterior half is exposed to danger by the adjoining lateral sinus, the danger diminishing the nearer we reach the process proper (?). The anterior half includes the mastoid cells proper. Ricard operates in the following manner: Vertical incision of the skin; the auricle is detached and pulled forward so as to expose the anterior half of the mastoid. The opening is made with the hollow chisel. The paper contains twenty illustrations. G. GELLÉ.

42. LACOARRET reports two cases in which inflammation of the mastoid process was cured through derivation by means of the thermo-cautery.

43. ORLOW'S patient, a woman, aged twenty-seven, was admitted to the hospital with the following symptoms: Slight

swelling of the soft parts above the mastoid process of the left temporal bone, painful on pressure ; at the upper margin a small suppurating wound made by incision, which, when probed, reveals at the bottom a denuded, rough, bony surface. Deafness in the left ear with purulent discharge, and perforation of the drum-membrane. High temperature (40.7° C.), intense headache, principally on the left side, loss of appetite, weak and highly accelerated pulse, extreme general weakness, apathy, and drowsiness. No cramps and paralyses, no stupor, although the patient answers unwillingly. The suppuration had existed since her tenth year, and intense pain for three weeks. In chiselling the mastoid process the antrum could not be opened, and the operation was about to be abandoned (!), when, with the last stroke of the chisel, offensive pus came forth from a small opening. The margins of the opening were broken off with the dressing forceps, and the opening thereby enlarged. The exposed substance appeared as a dirty-gray, cheesy mass, with distinct pulsation. "Apparently, with the last stroke of the chisel the cerebral cavity had been accidentally opened." After the operation all symptoms gradually disappeared, and the patient left the hospital with a fistula. Later on paralysis of the facial nerve appeared repeatedly at intervals. The description of this case is, I regret to state, quite inaccurate, so as hardly to enable the reviewer to form an opinion ; the history of the case does not offer a point in support of the supposition of a thrombosis of the transverse sinus.

44. In reply to the reproach made by v. Bergmann to aurists, that for the treatment of suppurations of the middle ear they have to depend upon syringing the external meatus, STAKE furnishes the proof, that in modern therapeutics we are conscious of our aim according to surgical principles and therefore justly demand recognition. Stake lays down the following rules for treatment : Syringing of the external meatus is in very few cases a therapeutic measure ; as a rule, it is preparatory to exposing the field of vision. On the other hand, syringing of the tympanic cavity from the tube is often sufficient to produce a cure, viz., in cases of simple suppuration of the mucous membrane. If this method is of no avail, in most cases disease of the bone has to be supposed. The best principle for the treatment is to provide for free discharge. To this end the removal of polypi, exostoses, sequestra is rarely sufficient, at least not in suppurations of the attic (malleo-incudo-squamous cavity). In the latter, syringing through

small openings and fistulæ is dangerous, while excision of the malleus is most appropriate. The suppuration, however, is usually due to disease of the accessory cavities, the diagnosis of which is greatly facilitated by fistulæ in the external meatus. If they are not present, the character and amount of discharge, persistent odor, and failures of treatment serve as points of support. Absence of inflammatory symptoms upon the mastoid process and in the external meatus do not militate against it. All these cases require the earliest possible chiselling, which is permitted, even necessary as an exploratory measure. The extensive use of the sharp spoon alone is impossible ; syringing with curved canulæ gives at the most only a temporary success (?).

45. PURJESZ used creoline in a solution of 5–6 drops to half a litre of lukewarm water in purulent otitis media. No irritation symptoms, diminution of discharge and its disappearance after a comparatively brief period.

NOSE AND NASO-PHARYNX.

46. OBMANN–DUMESNIL. Multiple chancre of the palate. *Ann. de derm. et de syph.*, 1888, p. 11.

47. MICHELSON, P. Nasal syphilis. *Volkmann's Sammlung klin. Vortr.*, No. 326.

46. Two typical syphilitic chancres upon the palate, which, followed by general symptoms, developed in a widower aged fifty-four, resulting, as he says, from a scratch by the point of a pipe.

47. The large deformations are like Cain's mark, on account of which they are the more dreaded by the laity, but they are still more alarming because of their proximity to the base of the skull and of certain difficulties as to treatment. The physician familiar with rhinoscopy ought to succeed in nasal syphilitic ulcers without heroic measures, and reach his aim, if the examination is based upon careful topical diagnosis. In all cases of gummous rhinitis the inspection of the oro-pharyngeal cavity requires special attention. The various ulcerations, polypoid degeneration of the turbinated bodies, atrophies of the latter and the thus produced spaciousness of the nasal cavities, the formation of sequestra, and their dangers are clearly pictured. The author justly warns against the indiscriminate use of nasal douches and nasal syringes in syphilitic rhinitis. They are more appropriately replaced by plugs in cases in which by stenosis of the cavity dangers to the middle ear, or in insufficient contractibility of the

soft palate and abnormal communications between mouth and nasal cavity aspirations into the tubes or into the larynx, are to be dreaded. The too early use of the sharp spoon is not advisable, while it is a real panacea in tubercular ulcers. The latter disease is important with reference to the differential diagnosis. The author concludes his paper with a consideration of the successful experiments of v. Mikulicz for raising sunken noses by means of supporting apparatuses and rhinoplasty. Moos.

REPORT OF THE PROCEEDINGS OF THE SECTION OF OTOLOGY OF THE 62D MEETING OF GERMAN NATURALISTS AND PHYSICIANS HELD AT HEIDELBERG, SEPTEMBER 17 TO 23, 1889. (Abridged.)

By G. KILLIAN, Freiburg in Breisgau.

Translated by Dr. Max Toeplitz, New York.

Kuhn (Strassburg) reports two cases of severe otitis media in diabetes, one of which resulted fatally from purulent meningitis in consequence of the extension of inflammation from the tympanic cavity into the sinus petros. superf. He urgently recommends the opening of the mastoid process in diabetics, even in cases of acute purulent otitis media, which are associated with profuse discharge and persistent pain, since he considers the suppuration of the tympanum as the sign of an acute diabetic inflammation of the bone, and he desires to prevent the deleterious extension of the otitis to the meninges.

Discussion: Walb, Kuhn, Koerner, Wolf, Moos.

Walb also advocates the early operation, believing that the suppuration of the middle ear is in such cases the consequence of an acute caries; this follows from a case in which by an early opening of the mastoid he had found a large carious process.

Koerner mentions a similar case (amount of sugar 230 grammes *pro die*). Although the mastoid was unchanged externally and hardly sensitive to pressure, the operation was performed under the supposition of an acute caries and yielded an excellent topical result.

O. Wolf had observed an acute purulent otitis media in a diabetic (with six to seven per cent. of sugar), which had recovered in spite of considerable doughy swelling of the mastoid without operation (cp. meeting of German naturalists at Wiesbaden).

Moos found in Koerner's patient, seventy-seven days after the beginning of the disease in the middle ear, principally diplococcus pneumoniæ and streptococci ; demonstration of the illustration.

KUHN further reports : " Bacteriological investigations in otitis media."

Investigations made by Drs. LEVY and SCHRADER, at his clinic, revealed in twenty-three cases of acute and chronic affections of the middle ear (seven cases of mastoiditis and two of cholesteatomata) the most different micro-organisms, in mild as well as in severe cases.

Moos : Contributions to the histology and bacteriology of diphtheritic affections of the middle ear. (The paper will be fully published in these ARCHIVES.)

O. WOLF (Frankfort-on-the-Main) : Test-words for examinations of the hearing and their value in differential diagnosis.

G. KILLIAN (Freiburg in Breisgau) : The muscles of the ear.

KILLIAN gives a preliminary communication of his studies for the determination of the morphological importance of the muscles of the ear. Accordingly the stapedius is the oldest muscle of the ear, then follow the tensor tympani, and finally the external muscles. The lowest vertrebrate in which a m. stapedius was found by the author, is the lizard ; it exists also in crocodiles, in birds, and in mammals. The tensor tympani, which together with the tensor veli palatini has developed from a part of the musc. pterygoideus intern., viz., from a muscle of mastication, is found exclusively in the mammals. The muscles of the external ear have been derived by Ruge from the platysma, namely, the anterior from a facial portion, the posterior, supplied by the ramus auricularis posterior, from an occipital portion.

L. KATZ, Berlin : The terminations of the cochlear nerve in Corti's organ.

KATZ describes that part of the peripheral termination of the cochlear nerve, which begins at the foramina nervina of the membrana basilaris and terminates externally from the outer rods in the epithelial structures of Corti's organ. Since the nerve proceeds here as an axis-cylinder and for quite a distance within epithelia, its representation is very difficult and demands excellent preservation (for which the human labyrinth can never be sufficiently fresh) and very thin sections. The method of teasing alone is not sufficient. The author has examined the cochleæ of rabbits, cats, and mice according to his method described at other places.

After a brief synopsis of the views of Waldeyer, Lawdowski, Hensen, Retzius (with the latter he agrees in almost every respect), he gives the following account of his results: The terminations of the cochlear nerve go through the foramina nervina of the membrana basilaris as axis-cylinders under the epithelium, which covers the basal pieces of the inner rods, and they form here an interlacement of nerve fibres with interspersed nuclei. The processes of these cells are apparently connected with the nervous reticulum, which itself is connected with the *innermost spiral tract* (which runs in cats and rabbits somewhat above Boettcher's cells) and also with the basal ends of the inner hair cells. From the *innermost spiral tract* thin fibrillæ run to the spiral tunnel tract, which runs outwardly from the inner rods, and from which the outer radiary fibres, studded at places with varicosities, radiate at different heights transversely through the tunnel toward the inner side of Deiters' cells and connect here with rosary-like nervous structures.

STEINBRÜGGE, Giessen, demonstrated specimens taken from the labyrinth of a boy who had died from a tumor of the glandula pinealis. The post-mortem revealed among other appearances increased intracranial pressure. At the examination of the cochleæ there was found bilaterally a considerable depression of Reissner's membrane and at places a bending of Corti's rods, due perhaps to mechanical pressure. The author is inclined to suppose a transmission of the intracranial increase of pressure through the aquæductus cochleæ upon the perilymphatic fluid and to derive therefrom the depression of Reissner's membrane.

HABERMANN also has observed this change of position of Reissner's membrane and has always considered it pathological.

A. HARTMANN, Berlin: The anatomical relations bearing upon chiselling of the mastoid process.

According to Bezold's and the author's examinations of the mastoid a place situated in the line of insertion of the auricle has proven to be the most suitable place for opening it, because the transverse sinus is thus easily avoided. When we penetrate to the depth of from 14 *mm* (Politzer) to 25 *mm* (Schwartze) we are apt to meet in this region the facial nerve and the semicircular canals. The speaker examined this condition more accurately in fifty temporal bones dissected with the saw horizontally at the level of the centre of the external meatus. The average distance of the place of operation (1 *cm* behind the spina supra meatum)

from the semicircular canals was 21.5 *mm ;* from the facial canal 22 *mm.* The parts mentioned may be injured at a depth of 17 *mm.* This condition remains unchanged in pathological temporal bones. But many pathological cases demand a deeper penetration ; the removal of the posterior wall of the external meatus, recommended for this purpose, frequently entails a danger, viz., just that of injury to the facial and the semicircular canals. The upper part of the tympanic cavity, called by the speaker cupola space (attic—Leydy), in which formation of polypi, accumulation of cholesteatomatous or thickened masses may take place, can be opened in different ways :

1. By opening the osseous layer which separates it from the external meatus (pars ossea of the drum membrane acccording to Walb). The speaker uses for this purpose an instrument, designated as the double chisel, and demonstrates some pieces of bone, which were removed with it.

2. In chiselling the mastoid process the antrum is enlarged anteriorly whereby free inspection of the cupola space is facilitated.

3. The entire anterior wall, the antrum, and the pars ossea of the drum membrane are removed, so as to establish free communication between the antrum, the cupola space, and the external meatus.

The selection of one or the other fields for operation depends upon the processes existing in the cupola space.

KESSEL has repeatedly removed the upper wall of the external meatus, viz., when fistulæ or caries were present, foreign bodies had to be removed or the stapes laid bare. He used chisels, which were made in such a manner as to prevent slipping.

SIEBENMANN, Bâle : Demonstration of metallic corrosion specimens of the labyrinth.

They are prepared according to his method, which is briefly described in Politzer's "Dissection of the Human Hearing Organ."

WALB, Bonn : Contribution to the indications and contra-indidications of the ear douche in the treatment of diseases of the middle ear.

Otitis media is invariably due to the invasion of micro-organisms. The middle ear can frequently overcome this invasion, without the development of suppuration and perforation of the drum membrane, on account of the existing conditions in the tym-

panic cavity which favor the death of the micro-organisms (exclusion of air, accumulation of carbonic acid). The air douche easily transfers germs into the tympanum, which are more dangerous than the germs existing there normally, and transforms a simple otitis media acuta into a purulent otitis.

Furthermore the air-douche in otitis acuta may have an injurious effect upon the pathologically changed drum membrane, causing perforation which otherwise would not occur.

Inflation of air furthermore throws the secretions of the tympanum, which are full of germs, into the cupola space and into the cavities of the mastoid process and thus produces inflammation, which is recognized by increased painfulness and swelling of the upper wall of the external meatus.

This danger also takes place in small perforations with profuse exudation.

Finally, in chronic affections of the middle ear, especially scleroses with secondary affections of the labyrinth, the speaker warns against inflations of air, when it is observed from the beginning that the ear feels duller and the tinnitus becomes more intense, because these cases result, as a rule, in impairment of the hearing power.

HABERMANN warns from the excessive use of the air douche in acute catarrhs of the middle ear, because he had observed six to eight hours subsequently occurrence of pain and of severe inflammation. He employs it no longer and has as good results as before.

G. KILLIAN narrates a case in which a serous or mucous exudation in acute otitis media, which had existed for ten to fourteen days without very many symptoms, except considerable hardness of hearing, was transformed by an air douche into a purulent otitis, which on the following day perforated the drum membrane. Otorrhœa of long duration was the consequence. With the inflated pus, cocci apparently entered the excellent nutrient soil existing in the tympanum.

KUHN believes that the air is injurious in acute affections more in a mechanical way.

BARTH: Contribution to the anatomy of the cochlea.

BRONNER (Bradford) has derived much benefit in swelling of the tubes and in sclerosis from the use of menthol vapors inflated into the tubes through the middle ear. He inserted for this purpose a capsule between balloon and catheter, which con-

tained pieces of brimstone imbued with a 20 per cent. solution of menthol oil (in olive oil). In severe sclerosis oil of eucalyptus and in chronic otorrhœa oil of turpentine or oil of cubebs were occasionally added. In furunculosis menthol was of no avail. The paper will be published in full in these ARCHIVES. Hartmann confirmed the latter statement from his experience.

HABERMANN (Prague) examined the cochlea of a man aged seventy-five, who had worked for twenty years with a copper hammer, and had become deaf. He discovered the absence of the nerves of the lamina spiralis and atrophy of the ganglionic cells of Rosenthal's canal in the basal turn beginning at the anterior turn and ending at the terminus. The atrophy extended to the trunk of the auditory nerve. Corti's organ was entirely missing at the place mentioned, but it was well preserved in the remaining cochlea. Habermann believes that the excessive influence of intense sounds of a high nature had led to paralysis of the nerves of the cochlear base and to secondary atrophy of Corti's organ. With reference to the disturbance of hearing of boiler-makers, deafness for high notes is characteristic according to his own experience and that of others. Habermann had also observed in this case that the stapedial plates were moved outwardly, and he explains this as a consequence of contraction of the m. stapedius, to which the function of protecting the labyrinth against the influence of too intense sound is attributed.

STEINBRÜGGE draws attention to the fact that atrophy of the ram. cochlearis and of Corti's organ is first developed in the first cochlear turns; also in inflammatory and chronic sclerotic processes, while either remains longer intact toward the cochlear point. In sclerotic affections the aim should be to find whether the processes in the cochlea are the expression of an atrophy from inactivity or the result of inflammation.

HABERMANN: The origin of cholesteatoma of the middle ear.

HABERMANN illustrates his theory of the origin of pearl tumors (*Archiv f. Ohrenheilk.*, 1888) by a new case. It was a tumor of the shape of a hollow ball, the surface of which was lined with mucous membrane of the tympanum, and was attached to the promontory, while the epidermis of the external surface of the membrana tympani was drawn into its interior through a perforation of the drum membrane.

Discussion: WALB, BARTH, KUHN, HABERMANN, KESSEL, STEINBRÜGGE.

WALB considers the cholesteatoma as products of immigration of the epidermis epithelium into the substance of the mucous membrane. This frequently takes place through a perforation in the membrana flaccida into the cupola space.

BARTH insists upon his former view, that the cholesteatoma is nothing more or less than cast-off masses of retained mucous membrane in epidermoidal degeneration.

VOHSEN (Frankfort-on-Main) demonstrates his *anoral respirator*.

In sufficiently free naso-pharyngeal passages mouth-breathing may continue as a matter of habit. Several apparatuses have been devised for its prevention which do not entirely answer the purpose. VOHSEN's device is firm and comfortable (children become used to it after one to two nights), closes the lips, and simultaneously presses the lower against the upper maxilla. This is attained by two rubber plates fixed by bands, which cross the vertex laterally and run around the occiput (manufacturer, Weil, Frankfort-on-Main ; Töngesgasse).

KESSEL demonstrates an electrical ear microscope and an electrical magnifying glass, which, combined with a Duplay's nasal speculum, may also be used for illuminating the nose. The apparatuses are supplied with cooling devices. The illuminating apparatus has a sound-conducting tube, through which sounds can be conducted to the drum membrane, while the vibrations can be observed at small, shining spots which had been marked thereon before.

VOHSEN recommends Schütz's diaphotoscop (manufacturer, Blänsdorf, Frankfort-on-Main), which he has changed in some respects. The circular incandescent lamp is replaced by an ordinary one, the central opening enlarged, and the entire instrument made thinner. He used it during the preceding year for the illumination of the ear, nose, and larynx.

HARTMANN : Clinical contribution to the empyema of Highmore's antrum.

The speaker reports a case which is of special interest because the existence of an affection of the lungs was suspected in the first stage of the disease. Patient, aged thirty-three, had in August, 1888, sanguinolent expectoration every morning. In default of proof of another source of the bleeding, the lungs were considered to be affected, and appropriate treatment employed. At the beginning of the year 1889 purulent, at times offensive, secretions followed the bleeding after the use of the nasal douche. Hart-

mann found pus in the middle nasal meatus, and accordingly diagnosed empyema of Highmore's antrum. Patient now remembered that the beginning of the bleeding had coincided with caries of the second upper tooth, which could be filled with difficulty. Extraction of the tooth and boring of the cavity through the alveola, whereby copious offensive pus was discharged. Patient goes after three irrigations into a sea-bath, and presents himself later as cured without further treatment.

The speaker supposed that, in filling the molar tooth the maxillar cavity was opened, and that at the opening granulations developed which caused the bleeding. Subsequent purulent disintegration, caused perhaps by the nasal douche, led to the symptoms of empyema.

Hartmann, in order to refute the objections that irrigations are of no avail, furthermore reported two additional cases of cure of empyema antri Highmori by three and four irrigations respectively from the middle nasal meatus.

Hartmann then demonstrated a spray for the nose, naso-pharynx, and larynx. It is remarkable on account of a new arrangement by which the current of air, produced by the double balloon, may be interrupted at will.

The President communicated to the Section that two additional papers in MS. were at their disposal for report. It was resolved to publish their titles in the Transactions and to examine the specimens accompanying Politzer's paper after the meeting. The titles are as follows :

1. "Anatomical and Clinical Studies on Acquired Atresia of the External Auditory Meatus," by Prof. Dr. A. Politzer.

2. "Aural Affections in Tabes," by Dr. Treitel.

The President of the day (A. Hartmann) further moved that the Section agree on the appointment of Drs. Moos, Kuhn, Kessel, Walb, and Hartmann as a committee to further the examination of otology at the "Staatsexamen."

The motion was carried.

At the conclusion Hartmann pointed out that the work of the Section had been exceedingly varied, interesting, instructive, and suggestive, and that they had received every inducement to spend the time outside the meetings in social pleasures. This was principally due to the untiring efforts of the leading chairman of the Section, Prof. Moos. He therefore requested the gentlemen present to rise from their seats as a sign of their gratitude.

This was done. Besides, he informed Prof. Moos that he would be soon presented with an album containing the pictures of the members.

Hartmann closed the meeting. The following gentlemen took part at the meetings of the section : Albers, Saar-Louis ; Appert, Karlsruhe ; Barth, Berlin ; Becker, Dresden ; Beckmann, Heidelberg ; Bloch, Freiburg in Breisgau ; Boeke, Magdeburg ; Bronner, Bradford ; Buss, Darmstadt ; Corubal, Neisse ; Diedrichs, Elberfeld ; Doering, Ems ; H. Ferrer, San Francisco ; Fischenich, Wiesbaden ; Friedländer, Nauheim ; Prof. Gottstein, Breslau ; Habermann, Prague ; A. Hartmann, Berlin ; Hecke, Breslau ; Hedinger, Stuttgart ; R. Heymann, Leipzic ; Jacoby, Magdeburg ; Kassnitz, Karlsruhe ; Katz, Berlin ; Katzenberger, Baden-Baden ; Keimer, Düsseldorf ; Prof. Kessel, Jena ; J. Killian, Worms ; G. Killian, Freiburg in Breisgau ; Koerner, Frankfort-on-Main ; Prof. Kuhn, Strassburg ; Lemcke, Rostock ; Lenz, Bretten ; Linkenheld, Wiesbaden ; Lommel, Homburg ; L. Mayer, Mayence ; Messer, Mannheim ; Prof. Moos, Heidelberg ; Pröbsting, Wiesbaden ; Roller, Trier ; Rothschild, Waldorf ; Sachs, Pforzheim ; Stark, Cincinnati ; Schliferowitsch, Heidelberg ; Prof. Schwalbe, Strassburg ; Siebenmann, Bâle ; Prof. Steinbrügge, Giessen ; Stöhr, Birkenau ; Strazza, Genna ; Szenes, Budapest ; Thiry, Freiburg in Breisgau ; Truckenbrod, Hamburg ; Usinger, Bensheim ; Vohsen, Frankfort-on-Main ; Prof. Wagenhäuser, Tübingen ; Prof. Walb, Bonn ; Wiehe, Kirchardt ; Weydner, Neckarsteinach ; O. Wolf, Frankfort-on-Main : 59 in all.

REPORT OF THE MEETINGS OF THE OTOLOGICAL SECTION OF THE BRITISH MEDICAL ASSOCIATION, HELD IN LEEDS, FROM 14TH TO 16TH AUGUST, 1889.

PRESIDENT—GEORGE P. FIELD, M.R.C.S.

The meetings of this section were more largely attended this year than, so far as we remember, in any previous year. In addition to a large attendance of British otologists, Professor Guye of Amsterdam, Dr. Blake of Boston, and Dr. Sexton of New York were present, and contributed materially to the work of the section. The great feature of the meetings was the discussion on the diagnosis of intracranial lesions due to ear disease—a discussion introduced by Dr. Wm. MacEwen, of Glasgow, in what might be termed a brilliant address. Dr. MacEwen's paper was largely reported in the lay newspapers, and tended to draw public and professional attention in a very marked way to the importance of suppurative forms of disease of the ear. His observation that a person who had a chronic discharge from the ear was in the position of one with a charge of dynamite in the interior of his head, which might explode disastrously at any moment, was a striking way of presenting to the mind the risk involved in these purulent diseases. This expression of opinion, coming as it did from a general surgeon of such eminence as Dr. MacEwen, had obviously more effect than it would have had from an aural specialist. Among the audience which filled the room while Dr. MacEwen delivered his address were the famous neurologists, Dr. Hughlings Jackson and Dr. Broadbent.

The subject selected for formal discussion on the first day was "The Treatment of Aural Exostosis." This was introduced by the president. Mr. Field referred in the first place to the causation of these osseous growths, and expressed the opinion that local sources of irritation, especially sea-bathing, are the most important factors. There were no conclusive data for the supposition that syphilis, gout, or rheumatism influence their production, nor does

heredity seem to have any special determining influence. The drill, worked by a dental engine, propelled by foot in preference to electricity, is, in Mr. Field's opinion, by far the most satisfactory method of operating for their removal. The operation rarely takes more than twenty minutes. Absolute rest for some days is insisted upon, and the patient is never allowed to leave the house under a week. In multiple exostosis the apices of all are drilled. Mr. Field does not regard with favor the use of the mallet and chisel, as these instruments are likely to cause, with every precaution, injury to the deep structures of the ear.

Sir Wm. Dalby followed with a paper on the same subject. After giving a short history of the use of the drill, he claimed for the electric drill superiority over the ordinary foot-drill, because it prevents bleeding, and by the rapidity of motion only very slight pressure is required. Sir William believed these growths to be sometimes congenital, and frequently the results of local irritation, such as the frequent entrance of water into the ear.

Mr. Marmaduke Shield next read a paper on "The Removal of Aural Exostosis by Displacement of the Auricle." In this operation the auricle is displaced forwards, after a semicircular incision has been made behind and below at the junction of the auricle with the side of the head. On reaching the junction of the cartilage with the bone, the former is divided, the cutaneous lining of the canal is pushed forward, and the exostosis being exposed, a small sharp chisel is applied, when a few smart taps of the mallet sever the exostosis from the proper osseous tissue of the canal. It is claimed for this operation that it gives free access to the deeper parts, and that, in addition to its facilitating the use of the chisel, it proves in certain cases an adjunct to the operation of drilling.

Dr. Barr next discussed the non-operative treatment of aural exostosis. Cases were related in which the osseous tumors seemed to close entirely the external canal of the ear, producing almost total loss of hearing-power, and yet where, after a time, during which local blood-letting, application of iodine, and careful cleansing were employed, the hearing returned to its previous condition. In those cases a certain degree of congestive swelling of the cutaneous lining over the growths closed temporarily the fine chink which usually existed, producing serious deafness; after the removal of this swelling the chink was restored. In this way operation may often be postponed for years, and may indeed never be called for.

Mr. Richard Ellis next described a case in which an osseous growth of the meatus stimulated a foreign body and caused deafness which was cured by its removal by means of the dentist's curved forceps.

A number of specimens of dried skulls with aural exostoses were next shown on behalf of Professor Politzer, by Mr. George Stone, of Liverpool.

A very important and interesting discussion followed, in which many gentlemen took part. Dr. Urban Pritchard thought that multiple exostoses should, in the large majority of cases, be let alone, but when they were likely to completely occlude, or when otorrhœa existed with blocking up by the bony growth, they should be removed. Dr. Barr was impressed with the frequency of the statements made by patients with aural exostosis that they were in the habit of frequently bathing in the sea or river. He thought that exostosis of the ear was much less frequent in Scotland than in London, judging from the experience of London practitioners. Professor Guye agreed with Dr. Barr that operation might in some cases be made superfluous by simple measures. He had on one occasion operated according to the method of Knapp. Mr. R. Ellis believed that exostosis was frequently connected with gout, and that the disease was much more rarely met with in females than in males. Mr. C. G. Lee referred to the infrequency of exostosis in the neighborhood of Liverpool, and Mr. Bendelark Hewetson remarked on its extreme rarity in Yorkshire. Mr. Hewetson believed it to be ultimately connected with gouty diathesis. In operating lately with a dental drill he used a 10 % solution of cocaine, and by its repeated instillation the pain was kept well down for an hour and forty minutes, the duration of the operation. Mr. Wm. Hill said that soft or peduncular growths could be easily treated by either snares, chisels, or forceps, but for the ivory ones no operation was so safe as the drill. Sir Wm. Dalby said he had never seen fewer than fourteen cases of osseous growth, and never more than forty in one year. The President remarked that he had operated on twenty-one cases during the past eighteen months. He had rarely recourse to the guard. A somewhat threatening discussion now arose between Sir Wm. Dalby and the President as to the question of priority in the introduction of the drill operation. At the suggestion of Mr. Urban Pritchard the matter was allowed to drop.

Professor Guye (Amsterdam) next contributed a paper on "Aprosexia, Being the Inability to fix the Attention, and Other Allied Troubles in the Cerebral Functions, Caused by Nasal Disorders." The first case which arrested Dr. Guye's attention was that of a boy whose father brought him because "the boy could not breathe through his nose and could not learn any thing." Dr. Guye removed a mass of adenoid tumors from the boy's naso-pharynx, and when the father brought him back a week later, he told Dr. Guye that his son had learnt the whole alphabet in that week, and that he thought him all right now. Many similar cases have come under the Professor's notice. It is of importance that the medical men in general practice make it a rule in every case of habitual headache, and inability to work and loss of memory, to inquire into the state of the nose and to ascertain if the normal nasal respiration be not impeded, and habitually or temporarily superseded by breathing through the mouth. In relation to this subject of Aprosexia, Dr. Wm. Hill, London, read a paper on "Some Causes of Backwardness and Stupidity in Children and the Relief of These Symptoms in Certain Instances by Naso-Pharyngeal Scarifications." Recent observation, Dr. Hill said, had tended to confirm Dr. Guye's views. He had been much struck by the fact that operations on children, undertaken for the relief of deafness associated with adenoid growths and hypertrophic conditions of the nose, had frequently resulted in immediate improvement in the mental acuteness of the patients altogether incommensurate with the often slight immediate improvement in the sense of hearing. The operations or scarifications act beneficially by relieving congestions of the intracranial lymphatic and venous systems which are in communication with the lymphatics and veins of the nose and naso-pharynx. Dr. Hill concluded his paper with the following sentence: "The stupid-looking, lazy child, who frequently suffers from headache at school, breathes through his mouth instead of his nose, snores and is restless at night, and wakes up with a dry mouth in the morning, is well worthy of the solicitous attention of the school medical officer."

Dr. Ward Cousins read a paper on "A New Antiseptic Artificial Membrana Tympani." This is composed of compressed cotton fibre swollen by prolonged immersion, and saturated in an antiseptic oil and ether. The soft material is then firmly compressed and dried by artificial heat. In shape it is like a miniature hat with a very high and tapering crown and a broad and

flat brim, having a short ribbon attached to the edge. It is just firm enough to retain its shape in the ear, and has a delicate flesh color, and is very light. It is introduced by means of a special probe. Dr. Cousins gave a demonstration of the use of this drum upon several patients in Leeds Infirmary, who were suffering from purulent disease of the ear. The results in most of the cases were satisfactory.

MISCELLANEOUS NOTES.

OTOLOGICAL PERSONAL AND SOCIETY NEWS IN ENGLAND.

COLLECTED BY DR. SILK.

ILLNESS OF SIR W. A. DALBY.—The numerous friends of Sir W. A. Dalby will be glad to learn that he has resumed professional work. In September last Sir William had an attack of synovitis in the right knee, the result of a sprain. He was confined to his bed for some weeks, but has now recovered.

APPOINTMENTS.

F. HARRIS, M. R. C. S., etc., has been appointed House Surgeon to the Liverpool Eye and Ear Infirmary.

H. E. JONES, M. R. C. S., L. R. C. P., formerly House Surgeon, has been appointed Assistant Surgeon to the Liverpool Eye and Ear Infirmary, vice J. Rose, resigned.

R. LAKE, L. R. C. P., M. R. C. S., has been reappointed Clinical Assistant for Diseases of the Ear at St. Thomas' Hospital.

C. J. LEURS, M.D., has been appointed Surgeon to the Ear and Throat Hospital, Birmingham.

W. MULLIGAN, M.B., C.M., has been appointed Assistant Surgeon to the Manchester Ear Institution.

G. H. WICKHAM, L. R. C. P., M. R. C. S., has been appointed Clinical Assistant for Diseases of the Ear at St. Thomas' Hospital.

A DISPUTED WILL.—A case in which the eye and ear institutions of Liverpool are concerned has recently been decided in the Court of Queen's Bench. The testator had during life interested himself in the work and management of the St. Paul's Eye and Ear Hospital, Liverpool. At his death it was found that he had directed his executors to hand over a certain portion of his estate to the managers of the "Eye and Ear Infirmary, Liverpool."

Naturally, the institution which goes by that name laid claim to the legacy, and their claim was confirmed at the first judicial inquiry, but on hearing further evidence on appeal, Baron Huddlestone and Mr. Justice Matthew reversed this decision in favor of St. Paul's Hospital.

OTOLOGY AT THE SOCIETY MEETINGS.

MEDICAL SOCIETY OF LONDON.—At the meeting on November 11th, Mr. Marmaduke Shield read an interesting case of cerebral abscess, due to ear disease, in which the patient was trephined over the temporo-sphenoidal lobe, and a small quantity of pus evacuated. No relief followed the operation, and death ensued within forty-eight hours. At the autopsy caries of the temporal bone was found, and an old abscess opening into the ventricles, which latter were full of pus.

Mr. Shield insisted very strongly upon the importance of early exploratory trephinings in these cases.

In the discussion which followed, Dr. Sainsbury and Mr. Battle referred to a case in which they had not succeeded in discovering a large cerebellar abscess by means of exploratory trephining. Dr. Havilland Hall and the President (Dr. Williams), dwelt on the importance of rejecting lives in assurance work if the candidates were found to be suffering from purulent ear discharges.

BRADFORD MEDICO-CHIRURGICAL SOCIETY.—At the meeting of this society held at Bradford on November 5th, Dr. Bronner showed a case of perforation from the mastoid antrum into the external auditory meatus, leading to the formation of an aural polypus.

BRITISH MEDICAL ASSOCIATION.—*South Midland Branch.*—At a meeting held at Hyham Ferrers on October 3d, Mr. Skelding read a paper upon naso-pharyngeal growths and their relation to health in children. He dwelt more particularly upon the frequency of these cases and the important bearing of such growths upon the mental and physical development of children afflicted with them. Illustrative cases were shown.

Midland Branch, Leicestershire Division.—At a meeting held at Melton Mowbray on October 24th, Dr. Bennett alluded to the frequency with which deafness, etc., was caused by post-nasal growths, and urged the importance of their early recognition and removal. Cases and instruments were shown.

Aberdeen, Banff, and Kincardine Branch.—At a meeting held at Aberdeen on November 20th, Dr. M. Booth showed a case of bilateral purulent tympanitis in which the hearing was greatly improved by the use of Yearsley's pellets, and Professor Ogston exhibited Dr. Ward Cousin's artificial drumheads.

CLINICAL INSTRUCTION IN OTOLOGY.

NEWCASTLE EAR AND THROAT INFIRMARY.—Nearly three thousand cases have been treated at this institution during the past year, and a course of lectures is about to be delivered by the Senior Surgeon.

LONDON POST-GRADUATE COURSE.—The prospectus of the First Course of Lectures and Demonstrations has been published, but we regret to find that no provision appears to have been made for instruction in aural surgery. This is a defect in an otherwise excellent scheme, which the managers will no doubt proceed to rectify in future courses.

GENERAL HOSPITAL, BIRMINGHAM.—A special department for ear and throat diseases has recently been created at this institution.

GENERAL NEWS.

DR. **Anton F. Von Troeltsch,** Professor of Otology at the University of Würzburg, died January 9, 1890, in his sixtieth year. He was the pioneer of modern otology in Germany. His anatomical and clinical work is fundamental and imperishable. In 1864 he founded, as far as we know, the first otological periodical, the *Archiv für Ohrenheilkunde*, which contains a greater number of important contributions than any other otological journal, and is now in its twenty-ninth volume.

DR. **Kirchner** has been appointed to succeed Von Troeltsch in conducting the Otological Clinic at the University of Würtzburg.

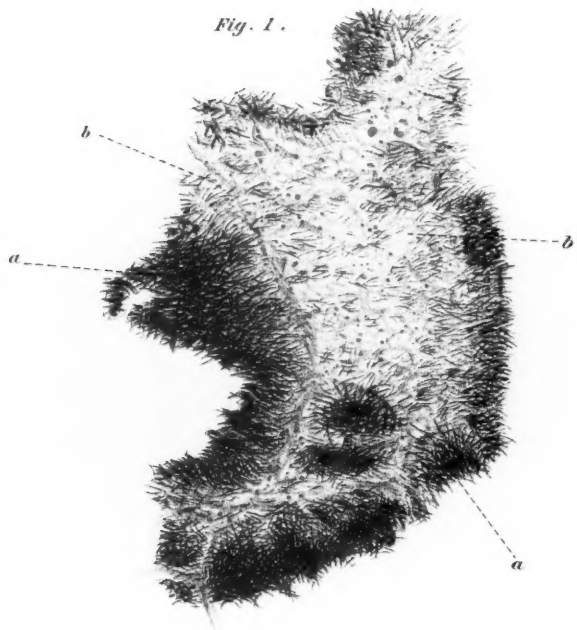
SIR **William B. Dalby** publishes a second edition of his "Short Contributions to Aural Surgery," 114 pages. J. & H. Churchill, 1890. It is handy to have Sir William's papers, which are scattered in different journals, but all of which are highly interesting and instructive, collected in a neatly printed little volume. This second edition contains, additionally, his last three publications: "The Management of Perforations," "The Limits of Aural

Surgery," and "The Removal of Bony Growths from the External Auditory Canal."

The **Tenth International Medical Congress** will be held at Berlin, from the 4th to the 9th of August, 1890. Professor Lucae, President, and Professor Trautmann, Secretary, of the Organizing Committee of the Section on Otology.

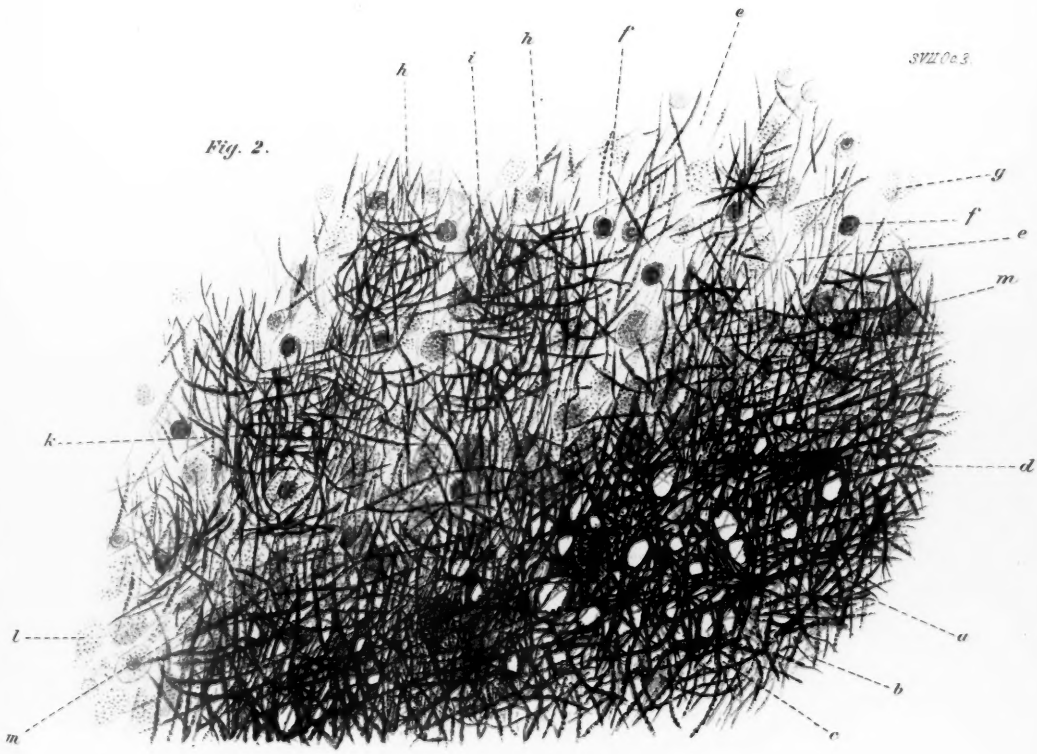
Fig. 1.

S.IV Oc. 3. Hartnk.



S.VII Oc. 3.

Fig. 2.



Ebb. del. C. Kirst, Leipzig.